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HENRY A. PILSBRY

Curator of the Department of Mollusca, Academy of Natural Sciences
PHILADELPHIA

CHARLES W. JOHNSON

Curator of the Boston Society of Natural History
BOSTON

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JAMES H. FERRISS

About 1900

The Nautilus.

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JAMES H. FERRISS

November 18, 1849–March 17, 1926

James H. Ferriss, the foremost of American land-shell collectors, was born in Kendall Township, Kendall Co., Illinois. His father, William H. Ferriss, was a native of New York State. His mother, Eliza M. Brown, was born in Lowville, Erie Co., Pennsylvania. On the maternal side the family had long lived in or near Erie, Pa., where his grandmother, Adeline Sloane, was born in 1811.[1]

In the fifties and sixties educational facilities in rural Illinois were not very good, and Ferriss' formal schooling did not go beyond the high school stage. He had a taste for reading and a retentive memory; in addition to these, he had a combination of qualities rarely found together in so high a degree: an intense interest in and sympathy for his fellow man, and a great love of nature. He was equally at home and happy in the turmoil of a hot campaign against the Joliet saloon and underworld forces, and in a lonely desert camp. That Ferriss did not go further in the more technical side of natural history was merely because life is too short; when at home, the demands of a large daily paper and innumerable details of park and other civic affairs absorbed his time.

As a boy, Ferriss at first worked with his father in the busi-

[1] I hope to receive further data regarding the Ferriss genealogy.

ness of buying cattle for the Chicago market, but in 1869, at the age of 19, decided to start out for himself, taking up a claim in southeastern Kansas. Until 1872 he was by turns farmer, freighter and storekeeper. It was the impression made at this time of the evil effects of drink in a pioneer community which made him a staunch advocate of temperance throughout his life.

In 1872 Joliet had a great access of population due to the establishment of steel mills. A "boom" was on. Tired of frontier life, Ferriss returned, obtaining a position as reporter on a Joliet paper. His knowledge of cattle and trade soon made his "market page" a prominent feature. Two years later he started a paper of his own at Yorkville, county seat of Kendall Co., Ill., but returned to Joliet in 1877 to take the management of the *Phoenix*. A few months later, with H. E. Baldwin and R. W. Nelson, he purchased the *Joliet News*. There was scarcely any real money in the Middle West at this time. The three young men, without capital or backing, hardly knew from one day to the next where to get money to issue the paper. One of Jim's fiery editorials offended a local political boss, and the editors of the *News* were jailed. The paper missed an issue, but release came the next day. The *News* was in the right, and became popular over night. New subscriptions and advertisements poured in, and the three proprietors did not miss any more meals.

From this time Ferriss was continuously editor of the *News* except between 1880 and 1882, when he edited a Maine paper backed by Neal Dow, the noted prohibitionist of those days. Finding the conditions irksome, he returned to Joliet, where the *News* thereafter was conducted by him as editor and Baldwin as business manager. In civic affairs the *News* stood for the best man, regardless of party, for better schools and a cleaner city. It was the terror of grafters and saloon politicians. In National affairs it supported the Populist party—an expression of the dissatisfaction of the Middle West with existing conditions. Loans contracted in the expansive years now had to be paid in a contracted currency. It was the era of unfair railroad tariffs and unrestricted monopolies. With the passing of these con-

ditions the party dissolved. Ferriss was National Chairman in the Convention of 1904. In 1915 he retired from active newspaper work. The *News* was merged with the *Herald*, becoming the *Joilet Herald-News.*

As a youth Ferriss was interested in the natural sciences, at first collecting trilobites and other fossils of the local Paleozoic. His first conchological discovery, I believe, was *Unio superiorensis* Marsh, which he found on one of several fishing trips to the north shore of Lake Superior, in the early nineties. Gradually the collection of mollusks and ferns replaced fishing as a vacation pastime. About 1896 he discovered the charms of the southern Alleghanies. "Surely it is an enchanted land," he wrote, "for I am homesick until I return." For the next six years he made annual visits to this lovely mountain region, in 1898 with George H. Clapp, in 1899 with Bryant Walker, Clapp, H. E. Sargent and myself. I suppose we will never forget this glorious trip. We felt that the combination of ravishing scenery, new snails and congenial companionship could never be surpassed.[1] In the following year Ferriss and Walker explored the mountains northward. Many new and fine land shells rewarded Ferriss' work in this region. Among malacologists, his name will always be associated with it, together with those of Rugel, Mrs. George Andrews and Miss Annie M. Law.

In February of 1899 and 1900 Ferriss made hasty trips into southwestern Arkansas, and early in 1901 a further exploration more northward and in Indian Territory (now Oklahoma). In March and April, 1903, Ferriss and I, starting in southwestern Missouri, hunted in other places in Arkansas and Indian Territory, thence into Texas, as far as the Devil's River and the spectacular canyon at the mouth of the Pecos. Among the new snails turned up in these several trips were such elegant helices as *Polygyra binneyana*, *indianorum*, *pilsbryi* and *unicifera*, the rare *P. kiowaensis* Simpson, and in Western Texas the genera

[1] NAUTILUS, XIV. Proc. A. N. S. Phila. 1900, 1902. It was in this region of East Tennessee and Western North Carolina that Miss Law had found *Polygyra chilhoweensis*, and Mrs. Andrews *P. andrewsæ* and *Vitrinizonites latissimus.* Ferriss thought that if women could discover such splendid species, a man ought to find one "as big as a tincup, with spines."

Daudebardiella and *Cochliopa*, new to our fauna. *Lampsilis simpsoni* Ferr. was also from one of these trips.[1]

February, 1902, was, I believe, the date of Ferriss' first Arizona collecting trip. It was a hasty one, mainly in quest of rare ferns, as he was trying to complete his collection of living U. S. ferns for the Joliet park. Land shells had second place, but he picked up enough to show the richness of the fauna, up to that time scarcely known. In 1904 snails had first place, and fine species of *Sonorella*, *Ashmunella* and *Oreohelix* were taken in the Huachuca and Chiricahua ranges. He described *Ashmunella walkeri* (Florida Mts.) and *Oreohelix clappi* at this time. The 1906 trip was with me, first in the Grand Canyon region, then south in the Florida and Chiricahua Mountains. Early December found us in the magnificent forest around the head of Cave Creek, the highest part of the range. Bivouacking at 10,000 ft., we woke one morning to find the world white with snow, and waded down to camp in Cave Creek through two feet of snow—a long day's tramp. In 1907 and 1908 Ferriss again visited the range, getting a few additional species in the southern canyons; in 1907 with L. E. Daniels. The land snail faunas of the Huachucas and Chiricahuas were described in 1909 and 1910.[2] No other ranges have supplied such remarkable assemblages of Sonorellas, Ashmunellas, Oreohelices and Holospiras.

In 1909, in company with L. E. Daniels, a trip was made across the Grand Canyon, on the Kaibab and Powell Plateaus. *Oreohelix strigosa depressa* in great abundance and variety was found, also the rare *Succinea hawkinsi* Baird. The results were published, together with those of our trip of 1906, in 1911.

In the expedition of 1910, L. E. Daniels and I joined. We camped in many ranges not before explored for shells.: the Santa Ritas, Baboquivaris, Dragoons and others. *Sonorella ferrissi*, *S. walkeri*, *Holospira danielsi* and *Oreohelix ferrissi* were part of the loot. There was something new about every day. Daniels introduced hot lemonade as a pick-me-up after a hard

[1] NAUTILUS, XIV; Proc. A. N. S. Phila., 1903, 1905, 1906, etc.

[2] "Mollusca of the Southwestern States." Proc. A. N. S. Phila. NAUTILUS XVIII.

day's shelling. Ferriss would take his tin cup full before the final ingredient was poured in.

In the limits of my space, all of the trips in Arizona and New Mexico cannot be described, but the chief ones may be mentioned.

1913. Catalina, Rincon, Tortillita and other ranges; afterward with Frank Cole "a splendid guide and biscuit maker" to the White and Blue Mountains, on the Gila headwaters.

1914. With Daniels, into the Mogollons, N. M., where an entirely new set of Ashmunellas turned up.[1]

1915. The Black Range, N. M., with the writer. From a series of camps along the ridge at 8–10,000 ft., and in magnificent forest, we collected such fine Ashmunellas and Oreohelices as *A. cockerelli*, *O. pilsbryi* and many others.[2] This was the last of the trips by wagon and pack train. Ferriss bought a Ford.

In 1917, 1918 and 1919 the ranges west of Tucson to Ajo, and those along the Mexican border, Tumacácori to the Whetstones, etc., were explored, partly with Frank Cole, the best of guides, partly with Hinkley and Camp.[3] *Bulimulus nigromontanus* Dall was one of the notable finds, the genus being new to Arizona.

The summers of 1916–17 were spent with the Sierra Club and in other travels in California.[4] In 1919 with a party in northeastern Arizona, an arid region, but of great interest for its wonderfully preserved cliff dwellings, natural bridges and Mt. Navajo.[5]

Early in 1921 a camping trip in the ranges around Death Valley was carried on in company with E. P. and Mrs. Chace. *Micrarionta* was abundant and varied. Later, with Prof. Edwin E. Hand and Dr. W. T. Miller, he went northward through central Arizona.[6]

In the autumn of 1922 Ferriss and I took the field in historic Santa Fé. The route was down the Rio Grande to the Organ Mountains, across the White Sands and desert to the Sacra-

[1] NAUTILUS, vols. 28, 29, 32; Proc. A. N. S. Phil., 1918.

[2] NAUTILUS, 1917; Proc. A. N. S. P., 1917.

[3] Moll. S. W. States XI, 1923. NAUTILUS, vol. 33: "Along the Mexican border."

[4] NAUTILUS, vols. 31, 32.

[5] NAUTILUS; vol. 33, p. 109.

[6] NAUTILUS, vol. 35, p. 123.

mentos and north to Nogal Peak, then into the Guadalupe range in southeastern New Mexico and Texas, and south to the Chisos Mountains in the Big Bend of the Rio Grande. The results of this trip will soon be published; there is a great deal of interest, since much of the ground was new. Early in 1924 Ferriss again visited western Texas.[1] His last trip, in the spring of 1925, was in the same region, but cut short by ill-health.

In later years Ferriss became increasingly interested in cacti, collecting great numbers for use in the beautiful monographic work of Dr. J. N. Rose, and for his own collection in a large greenhouse built for their cultivation in the West Park, Joliet. To spin along over a rocky desert with Ferriss at the wheel and at the same time looking sharply for wayside cacti was an education for the nerves. Very few large stones were missed. On a long trip the only place in the car free of cacti would be the bed-roll.

Ferriss was an ideal camping companion. He loved life in the open, had great endurance, an unfailing optimism, and an exhaustless store of entertaining talk. He was at his best in camp, and drew out the best in others. The prospector or cattleman who chanced to drop into camp often stayed swapping reminiscences around the fire far into the night—tales of the Indian times, of Apache Kid, Cochise Stronghold (where we camped), and of course, of the search for lost mines. Nearly everywhere Ferriss found somebody he knew, or who knew a friend of his, and he was heartily welcome in hundreds of places throughout the southwest.

As a collector he has probably never been surpassed. Ferriss found more new land shells than any American since the time of Thomas Say; and he generously shared his finds with those most interested. Some account of his discoveries will be given at another time.

The portrait now given is an excellent likeness of Ferriss as I first knew him. In later years his face, always strong and fine-featured, became deeply lined and bronzed by exposure.

Ferriss had no children. His wife survives him.—H. A. P.

[1] NAUTILUS, vol. 38: "On the Rio Grande."

(*To be continued*)

SOME NOTES AND A LIST OF SHELLS OF RIO, KENTUCKY

WILLIAM J. CLENCH
Kent Scientific Museum, Grand Rapids, Michigan

Rio is a small settlement, located on the north bank of the Green River, Hart Co., Kentucky, between 30 and 40 miles upstream from Mammoth Cave.[1] During the past two seasons, collections were made at this place, as conditions were very favorable for molluscan life. On the first trip, in 1924, considerable time was spent collecting land shells, as we reached Rio about the first of August when conditions were at their best. On the 1925 trip we did not reach this place until the latter part of September, and after an abnormally dry summer, which was rather unfavorable for land-shell collecting.

This particular section of Kentucky is in the physiographic region designated as "The Knobs," a narrow belt of land which entirely surrounds the bluegrass region except on the north. The Knob Region is characterized by isolated hills, usually steep-sided, well forested and containing many springs and creeks. Outcrops of limestone cover their sides, and many of the highest hills are capped with sandstone. They are not very high but lend a picturesque feature to the landscape so noticeable after leaving the rolling bluegrass region. The upper tributaries of the Green River have their rise in The Knobs and the river itself skirts the southern edge for quite a distance. At Rio the river reaches quite a good size, with long stretches of slack water broken at irregular intervals with gravel and stony riffles.

On both trips the collecting was confined to the vicinity of Rio, not extending more than one-half mile down stream from the toll bridge and only a short distance above it. About an eighth of a mile north of the the town Glen Brook Spring is located, whose waters have been dammed to run a small power plant. The capacity of the spring is considerable—nearly sufficient to fill a three-foot pipe leading to the power plant. All

[1] See "Vagabonding for Shells," NAUT., Vol. 38, 1925, 133.

of our land-shell collecting in 1924 was confined to the hillsides adjacent to the spring The southern hillside was very wet and the mollusks rather abundant, both as to species and individuals. The northern hillside, which was much drier, yielded only *Polygyra plicata* Say, found under stones, and a few *Gastrodonta ligera* Say among the leaves.

In the spring we collected *Goniobasis laqueata* Say in abundance as well as on the sides of the dam where the water was spilling from under the loose flashboards, and in the creek immediately below the dam.

The dam itself, along its sides, contained *Physa microstoma* Hald. and *Lymnaea humilis modicella* (Say). The *Physa* were far more numerous in 1924 than they were in 1925. Conditions for the fresh-water forms appeared to be exactly the same for both years, yet there was a considerable difference in the number of *Physa*. The explanation of such periodic "waves" of abundance of some species of mollusks is still an open question. It is possible that in some cases a very heavy infestation of larval trematodes is responsible for such fluctuations in their numbers.

The Green River was richest in species on the shoals. The Unionidæ were so thick in one place that the individuals actually touched one another. The 1925 catch at this point was much greater in number of species than that of 1924. The last season we had the advantage of very low water which aided the collecting of live shells materially, and also the collecting of many dead specimens which were found along the margins of a long island that divided the riffle into two parts at its lower end. Here the mussels had been trapped in the shallow depressions and irregularities along the island edge and had died as the receding water left them high and dry. This opportunity gave us the advantage of sorting out the various species and of selecting the best specimens.

On the rocks bordering the river some splendid specimens of *Goniobasis curreyana* Lea and *Lithasia obovata* Say were collected, though they were not quite as abundant here as they were farther up the river.

On the 1924 trip Remington and I investigated the slack

water area above the bridge. It was here that we took our first specimens of *Pleurocera undulatum* Say. The south side of the river at this point consisted of a gently sloping, muddy bank. Along this bank in about a foot of water we found *P. undulatum* to literally pave the bottom. A few *Campeloma integrum* (Say) and two species of Uniones (*Lampsilis siliquoidea* (Barnes) and *Proptera alata* (Say) were also obtained.

P. undulatum is purely a mud inhabitant. It appeared for the first time at Greensburg, where long stretches of slack water allow the mud and silt to settle. A little above Greensburg the river contains many riffles, and the slack water areas are short. During high water these areas would be more or less swept free of any accumulations of this material. I am inclined to believe that this is the limiting factor in the upstream distribution of this species rather than any other single agency. The young of this species will cling to the sides of clean rock, but the adults are usually found half buried in the deep silt along the river banks or in the deposits of this material on the tops of the rocks and ledges.

Some ecological notes concerning *Goniobasis laqueata* Say might be of interest here. This species was only collected in running water. As noted above, it was found in the spring or on the side walls of the dam and also below the dam in the small creek.

The forms found in the spring had deeply corroded spires, in some cases as many as three whorls were missing with the fourth whorl noticeably pitted. The specimens collected on the wall of the dam and in the creek below were entirely free of such corrosion. This is by no means an uncommon occurrence in spring forms; in fact, it seems to be the general thing, throughout this section of the south. Decollated forms of *Goniobasis nassula* Conr. and *G. carinifera* Lam. were found in similar situations. The former were collected at Huntsville, Alabama, in the Big Spring during the 1924 trip. This spring had been dammed to create a shallow pond in a small park. The species was found only in the pond and most abundantly near the spring. It was entirely replaced by *Pleurocera brumbyi* Lea in the creek below the pond which species showed but very little corrosion.

The corroded specimens of *G. carinifera* were found in an artificial lake at the mouth of a spring at Cleveland, Tennessee. This lake was fed entirely from the spring. It bubbled up in many places through sand, each outlet being surrounded by aquatic plants that were partially or wholly submerged in the water. In this situation thousands of *G. carinifera* congregated, all showing the corrosive effects of some chemical agent. About a fourth of a mile from the spring a dam had been built across the lake, with outlets at each end. These flowed into a second portion of the lake that was some four feet below the level of the first portion. In the largest outlet we found *G. carinifera* covering all the stones on the bottom and even on the cement sides of the small spillway. All of the specimens collected in this part of the lake had perfect spires, not in any way affected by chemical action.

It is quite possible that CO_2 in the form of carbonic acid, H_2CO_3, is responsible for this corrosive action. Many springs throughout this region carry this gas under pressure which is released upon the water emerging from the ground. The limestone caves in Kentucky and southern Indiana are results of this action, carried out over a long period of time. The composition of the shells is practically the same as that of the limestone, being nearly pure calcium carbonate (Cooke, p. 252). Calcium carbonate is nearly insoluble in pure water, but when carbon dioxide gas is dissolved in the water there is farmed an aqueous solution of carbonic acid, H_2CO_3. This attacks the calcium carbonate, converting it into calcium bicarbonate, $H_2Ca(CO_3)_2$, which is soluble in water.

The mollusks living in the mouth of the spring would get the full effects of this corrosive action, and those more distant from the spring would be less affected after the acid had been neutralized or passed off in the form of CO_2 upon contact with air and the release of pressure. At Rio, Kentucky, and again at Cleveland, Tennessee, standing water seemed to be the intervening factor between the corroded and the non-corroded forms. This would point more or less to CO_2 as the corrosive agent rather than humic acids, as I do not believe that humic acids are materially affected upon standing unless they come in con-

tact with some material with which they would react. CO_2 on the other hand, would be released, thus reducing its action in the form of carbonic acid.

The condition at Huntsville, Alabama, is quite similar, though not as good an example since here two species were involved. *G. nassula* seemingly preferred the waters about the spring, disappearing in the outlet, while *Pleurocera brumbyi* made its appearance at this point and continued on down the small creek. It is possible that running water is the real factor in the separation of the two species, though I am more inclined to believe that chemical rather than physical agents are the barriers.

Other species such as *G. proxima* Say, seem to prefer springs, and disappear entirely a short distance from the source.

Jewell (p. 26) lists nine species of Unionidæ from the Big Muddy River (Illinois), that were very much corroded. This is described as a naturally acid stream. *Pleurocera elevatum* was the only gasteropod noted, with no mention of its condition.

Grier (p. 15) summarizes our knowledge of this question but uses the term erosion for both chemical and physical action upon the shell. The term erosion should however be limited to the action of physical factors, such as sand, gravel and stones, which in many rivers are responsible for shell destruction. In many cases erosive action is the first to start the destruction of the shell by tearing away small portions of the protective periostracum when the corrosive factors continue the work on the unprotected layers beneath. At such places as Huntsville, it is quite impossible to place the blame on mechanical injury; the undisturbed pond with its cement bottom and abundance of plant growth give sufficient protection from this cause.

The following data based on pH readings in Glen Brook Spring and adjacent waters do not bear out my contention in regard to the acidity of the water in the spring inasmuch as the readings in both the spring and in the dam and creek below show a basic condition. However, the readings in the spring are notably lower or nearer neutral than those of the dam and creek. It had been raining for two days previous to the taking of these readings and the influence of surface run-off no doubt

had seriously affected the usual conditions. A portion of the spring water is obtained from surface run-off as indicated by the lessening volume of the spring on the third day. Small rills entered the dam and a large one entered the creek about one hundred feet below the dam. Those entering the dam had dried up early in the morning of the third day but the one below the dam continued to flow throughout our stay. The change from pH 8. on the second day to that of pH 7.6 on the third day is, in all probability, due to the drying-up of the rills entering the dam. It is to be regretted that our short stay at this place prevented another reading under more normal conditions.

Readings

Locality	Sept. 22 2nd day	Sept. 23 3rd day
Spring	7.4	7.4
Dam	8.	7.6
Creek, 400 feet below dam	8.	8.

(*To be continued*)

FOSSIL VIVIPARUS-LIKE CALCAREOUS OPERCULA[1]

BY WENDELL P. WOODRING

Pliocene *Viviparus*-like calcareous opercula (*Scalez petrolia* Hanna and Gaylord) from California were briefly described in an article in the last number of The Nautilus.[2] After this article was in type, Dr. Pilsbry called my attention to a fossil from the Eureka District of Nevada that was named *Ampullaria?*

[1] Published with the permission of the Director of the U. S. Geological Survey.

[2] Woodring, W. P., Pliocene *Viviparus*-like opercula from California. Nautilus, vol. 39, no. 4, pp. 109–111, 1926.

powelli by Walcott[1] and assigned by him to beds of lower Carboniferous age. The type material of this species shows that the shell is much more similar to *Viviparus* than would be supposed from the figure, which apparently was drawn with a living *Ampullaria* as a guide. The body whorl is not so inflated with respect to the other whorls; the spire is relatively higher; and the aperture is less elongate. Opercula that clearly belong to this species, although they have not been found in the apertures of shells, also are more viviparoid than the figure shows. These opercula, which are calcareous and are much more abundant than shells, are very similar to *Scalez petrolia*, but they are smaller and their nucleus is a little farther from the columellar edge.

Dr. T. W. Stanton, of the United States Geological Survey, also called my attention to a calcareous operculum in a collection of fossils from the Judith River formation (Upper Cretaceous) cropping out at the mouth of Meili Coulee near Havre, Montana (locality 2794, U. S. Geol. Survey register of Mesozoic invertebrate fossil localities). This operculum resembles *Scalez petrolia*, but it is a little smaller, more elongate, and its posterior end is more pointed. These beds carry a large *Viviparus*-like shell that is much too large for this operculum, unless it belonged to a young shell.

The United States Geological Survey recently received from Dr. J. C. F. Siegfriedt fossils collected from a bed of Fort Union (Eocene) age overlying the coal in the Eagle Coal Mine at Bear-creek, Montana (locality 13459, U. S. Geol. Survey register of Mesozoic invertebrate fossil localities). This collection contains calcareous opercula similar to *Scalez petrolia*, though again they are smaller and their nucleus lies a little farther from the columellar edge.

According to these records, fossil *Viviparus*-like calcareous opercula are not so rare as was supposed when the previous article was written. They have been found in beds of supposed lower Carboniferous age in Nevada, in Upper Cretaceous and

[1] Walcott, C. D., Fresh-water shells from the Paleozoic rocks of Nevada: Science, vol. 2, p. 808, 3 figs., 1883. U. S. Geol. Survey Mon. 8, p. 261, figs. 4, 5, 1884.

Eocene beds in Montana, and in Pliocene deposits in California. Apparently all these specimens represent the same generic type; at least all are similar to *Viviparus* and all are calcareous. No record has yet been found of living Viviparidæ that have calcareous opercula.

FURTHER NOTES ON SCALEZ PETROLIA

BY DR. G. DALLAS HANNA

This organism, presumed to be a mollusk, was originally described from operculum-like objects preserved in the upper part of the Etchegoin (Pliocene) formation of the southern end of the San Joaquin Valley, California.[1] Dr. W. P. Woodring[2] has recently recorded the finding of *Viviparus*-like shells associated with the opercula and which appear to have belonged to the same organism. For some reason the shell was exceedingly thin and delicate, yet the operculum was comparatively massively developed, a condition which is presumed to have been brought about by the changing of the old Etchegoin marine sea to the Tulare freshwater lake.

The organism did not last long as would be expected of such a specialized development, but it grew in prodigious abundance while it did exist. A few feet of strata mark its vertical range and for this reason it has become one of the best "markers" of a definite zone yet discovered in petroleum geology. It likewise had a fairly wide "horizontal" distribution, having been found in wells drilled in the center of the San Joaquin Valley, as well as for many miles, north and south, along the western border.

Unfortunately the original description contained two errors, one of which was avoidable, and this opportunity is taken to make the corrections. The type specimens came from the Midlands Oil Company's Well No. 1, Sec. 34, "T. 32 S.", R. 24

[1] Hanna & Gaylord, Proc. Calif. Acad. Sci. 4th ser., Vol. 13, 1924, pp. 147–149, 2 figs.

[2] NAUTILUS, Vol. 39, No. 4, 1926, pp. 109–111.

E., M. D. M., Kern County, California, the depth being given as 3306 feet. Through a typographical error the number of the township was given as T. 32 S., whereas it should have been T. 31 S. Subsequent discovery of the organisms in a great many wells in that general region has practically proved that the depth given must be erroneous and should be about 4020 feet. The geologist who made the original collection found the depth-data on the cores at the well somewhat uncertain, but failed to note this fact in the transmission of the material to the laboratory. It was impossible, with the data then available, to detect this error, and it was only discovered when subsurface contour maps were in process of construction. In the early days of economic micro-paleontological work the necessity of exact locality data was not fully appreciated by all of the field geologists.

The specimens from Pacific Oil Company well No. 23, Sec. 35, T. 30 S., R. 24 E., M. D. M. are indicated as having come from a depth of 3000 feet. The total depth of the well was 3005 feet and the shales containing *Scalez* were blown out by gas after the drilling was finished. It was generally supposed by the field geologists that they came from the bottom, but subsequent plotting on subsurface maps indicates that they were blown from a depth of approximately 2108 feet below sea level, the elevation at that point being 707 feet.

The writer agrees fully with Dr. Woodring in the belief that the genus name chosen was somewhat unfortunate, but it is believed that our action may be excused when the facts which controlled the selection are made known. It so happened that the layer bearing the opercula had been previously found in several wells other than those mentioned in the original description and field men generally had come to refer to them as "white fish scales" and the term had been entered on the "logs" in that form. Obviously, we wished to change this practice; we did not want to let so important a fossil be continually referred to by a name so far from correct. In considering ways whereby a name in common usage might be displaced, the most feasible means appeared to be to select one similar in spelling and sound to the one in use. Therefore, we

chose *Scalez* from among several which were considered. The effectiveness of the displacement of the term "white fish scales" can be attested to by any one familiar with recent subsurface work in the region concerned.

TEXAS LAND AND FRESHWATER SHELLS

BY E. G. VANATTA

Dr. Julia Gardner in the course of geological work collected a box of drift on the south bank of the Colorado River, 1½ miles below the Travis-Bastrop County line, Texas, on June 16, 1925, from which the following species of shells were picked.

One sinistral specimen of *Pupoides marginatus* was found among about 100 dextral specimens of various sizes.

It is interesting to find *Gastrocopta corticaria* so far west. *Planorbis cultratus* is further north than before recorded, and the ranges of various other species are extended.

Helicina orbiculata tropica 'Jan.' Pfr.
Praticolella berlandieriana Moric.
Praticolella campi C. & F.
Polygyra auriformis Bld.
Polygyra mooreana Binn.
Polygyra texasiana Moric.
Polygyra roemeri Pfr.
Polygyra thyroidus Say
Polygyra fraterna friersoni Pils.
Bulimulus dealbatus mooreanus 'Binn.' Pfr.
Pupoides marginatus Say
Pupilla mucorum L.
Gastrocopta armifera Say
" *contracta* Say
" *pentodon tappaniana* Ad.
" *corticaria* Say
Gastrocopta procera riparia Pils.
" " *sterkiana* Pils.
" " *mcclungi* Hanna
" *cristata* P. & V.
" *hordeacella* Pils.
Vertigo tridentata Wolf
Vertigo milium Gld.
Strobilops labyrinthica texasiana Pils.
Vallonia parvula St.
Omphalina fragilis Binn.
Polita roemeri Pils.
Polita indentata umbilicata Ckll.
Euconulus trochulus Reinh.
Striatura milium meridionalis Pils.
Zonitoides arboreus Say

Pseudohyalina minuscula Binn.
" *singleyana* Pils.
" *nummus* Van.
Anguispira alternata rarinotata Pils.
Helicodisus eigenmanni Pils.
Punctum pygmaeum Drap.
Succinea avara Say
Carychium exiguum Say
Carychium exile Lea
Physa integra Hald.
Lymnæa techella Hald.
Planorbis trivolvis Say
" *antrosus* Conr.
" *liebmanni* Dkr.
" *parvus* Say
" *dilatatus* Gld.
" *cultratus* Orb.
Planorbula obstructa Morel.
Cincinnatia cincinnatiensis Anth.
Musculium transversum Say.

AN INTERESTING RADULA (EOCYPRAEA ADAMSONII SOW.)

BY DR. PHIL. F. A. SCHILDER
Naumburg a S., Germany

In 1924[1] I established a new sub-family Eocypræinæ, intermediate between Cypræinæ and Amphiperasinæ; its characters were taken from the shells, especially from those of the fossil species. Now I have information also of the radula of *Eocypræa adamsonii* Sow., the only recent survival of this genus, which is otherwise represented by numerous species inhabiting all seas, especially from Upper Cretaceous to Eocene times.

Its radula justifies the new sub-family Eocypræinæ. The median tooth is like in many Amphiperasinæ (*Simnia purpurea* Risso, for instance), but all cuspides are much longer. The admedian tooth shows the same external prolongation as *Simnia purpurea* Risso, and *Amphiperas adriatica* Sow., but the flabellum of its body is very peculiar. The uncini are quite distinct: inner one recalls *Pedicularia*, being elongate, with 3 cusps, while the outer one is flabelliform, but much narrower than in Amphiperasinæ. I counted about 350 rows of teeth, while there are in Triviinæ 40–70, in *Pedicularia* 75, in Cypræinæ 65–230, in Amphiperasinæ 70–150, and in the large *Amphiperas ovum* Linn. only, 240–300.

[1] Archiv für Naturgeschichte, xc, pp. 182, 205 (1924).

According to Prof. Thiele (Berlin), the radula of *Jenneria pustulata* Lam. is similar to that of *Eocypræa adamsonii;* also I have been told *Sulcocypræa*[1] *concinna* Ad. Rv., is allied to Eocyprœinæ. The other genera, however, formerly included in Eocyprœinæ do not belong to this group (excepted *Transolula); Calpurnus* is an aberrant form of Amphiperasinæ, *Cypræogemmula* seems to be allied to *Pedicularia;* the anatomy of *Umbilia hesitata* Ired.[2] proves that this genus (and *Gisortia*), though

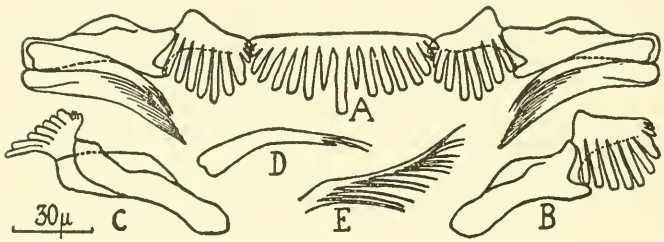


FIG. 1. A, one row of the lingual teeth of *Eocypræa adamsonii* Sow. B, one admedian tooth (left side), dorsal view. C, one admedian tooth (left side), basal view from behind. D, one inner tooth (left side), dorsal view. E, flabellum of the outer uncinal tooth, unfolded (left side), basal view.

very primitive (the third branch of the osphradium still being short!), belongs to Cyprœinæ. *Mandolina* and its predecessor *Archicypræa* (new, type: *lioyi* Bay.) form an ancient branch intermediate between Cyprœinæ and Eocyprœinæ. The systematic position of *Cypræovula* can not yet be determined certainly: the shells of the 6 species restricted to South Africa look very ancient (they seem to be most nearly allied to shells from the Eocene of Australia: *Austrocypræa pyrulata* Tate); I have not yet succeeded in getting a radula, all specimens of the common species (*capensis* Gray, *edentula* Gray) being beach shells.

[1] There is no difference between the shells of "*Ovulum concinnum*" Ad. Rv., from the Indopacific Ocean and the Eocene species of *Sulcocypræa* Conr., viz.: *mathewsonii* Gabb, *lintea* Conr. (= *kennedyi* Harr.), *vaughani* Johns., and *healeyi* Aldr. (= *dalli* Aldr.). *Sulcocypræa* must not be confounded with *Cyprœdia* Swains., which belongs to Triviinæ.

[2] Vayssière, Récherches zool. et anat. Moll. Cypraeidés I. (Ann. Mus. Hist. Nat. Marseille, Zool., xviii), p. 80, t. 2, figs. 23–26 (1923).

TWO NEW SPECIES OF DENTALIUM FROM THE EOCENE OF PERU

BY E. WILLARD BERRY[1]

During the examination of the Saman shale of northwestern Peru for micro-fossils I discovered the following two new species of *Dentalium*. They are both rather small forms, distinctive in characters and not especially common. The Saman shale is probably upper Eocene in age. These new Dentalia are named and described as follows:

DENTALIUM SAMANICUM n. sp. Figs. 3, 4.

Shell very slightly curved, tapering but little, at the rate of 0.2 millimeters per centimeter. Cross section circular. Surface with growth lines and 30 longitudinal ribs or costae. These ribs are of two sizes, the smaller being less than half the height of the larger, alternating in position so that every other one is of the same size. Length 7 millimeters. Maximum diameter 2.2 millimeters.

Locality.—Negritos, Peru.

A number of Eocene species of Dentalium show this alternation of ribbing. Among these *Dentalium samanicum* differs from *Dentalium mississippiense* Conrad,[2] a much larger form from the Jackson of the United States, in having fewer ribs and more prominent growth lines. The Peruvian form is also similar to *Dentalium alternatum* Lea,[3] from the Claiborne of Alabama and Mississippi, which is also a larger and a more tapering form.

DENTALIUM BOGGSI n. sp. Figs. 1, 2.

Shell more curved, tapering but slightly, at the rate of 1.6 millimeters per centimeter. Cross section circular. Surface ornamented with 16 strong equal ribs or costae. Growth lines faint. Length 5 millimeters. Maximum diameter 2 millimeters.

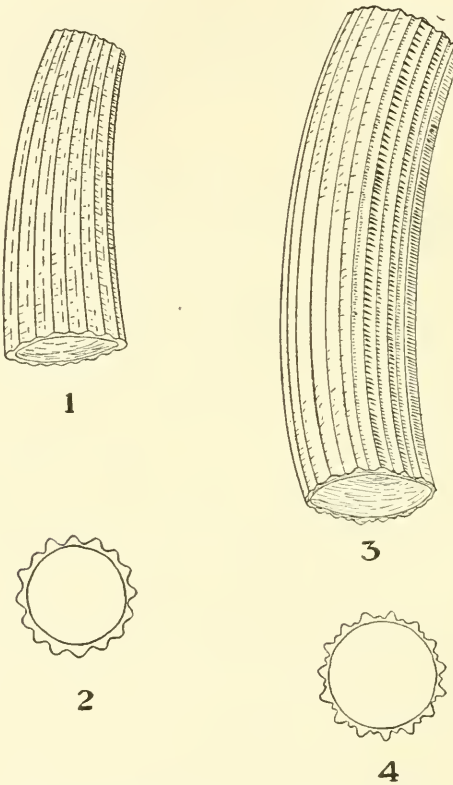
[1] Published by permission of the Chief Geologist of the International Petroleum Co., Ltd.

[2] Conrad, Jour. Acad. Nat. Sci. Phil. 2nd ser., vol. 1, p. 112, pl. 11, fig. 1, 1848; Clark, Md. Geol. Surv., Eocene, p. 159, pl. 29, fig. 8, 1901.

[3] Lea, Cont. to Geology, p. 34, pl. 1, fig. 2, 1833.

Locality.—Negritos, Peru.

This species is named after O. D. Boggs, who was the first to study the micro-fossils of this region. It is about the size and



FIGS. 1, 2. *Dentalium boggsi* n. sp. 1, lateral view; 2, cross section.
FIGS. 3, 4. *Dentalium samanicum* n. sp. 3, lateral view; 4, cross section.
All 8 times natural size.

form of *Dentalium annulatum* Meyer[1] of the Claiborne of Alabama, but is ribbed instead of being annulated.

[1] Meyer, Contributions to the Eocene Paleontology of Alabama and Mississippi. Geol. Surv. Alabama, Bull. 1, p. 64, pl. 1, fig. 1, 1886.

A LIST OF THE MOLLUSKS COLLECTED BY MR. OWEN BRYANT ALONG THE COASTS OF LABRADOR, NEWFOUNDLAND AND NOVA SCOTIA

BY CHARLES W. JOHNSON

(*Continued from Vol. 39, page 135*)

C. stimpsonii var. *brevis* (Verr.). St. Pierre.—5 f. N. S.—14 miles S. of C. Sable, 45 f.

C. (*Siphonorbis*) *pygmaeus* (Gould). N. S.—20 miles E. S. E. of C. Sable, 70 f.; 43 miles W. by S. of C. Sable, 110 f.

C. (*Aulacofusus*) *lividus* (Mörch.). Lab.—Mettek I.; off Hebron, 60 f.; Egg Hbr., 7 f. N. F.—S. by E. of Burin, 110 f.

Ptychatractus ligatus (Migh. & Ads.). N. S.—Roseway Bk. E. of C. Sable, 45 f. *Terebratulina septentrionalis* was quite common at this station.

Admete couthouyi (Jay). Lab.—Off Fish I., 80 f.; between C. Mugford and Hebron, 60 f.; Nain, 7 ft.; Shoal Tickle, 25 f.; off Egg Hbr., 20 f.; off Beach I., 80 f. N. S.—Browns Bk., 40 f.

Lora pleurotomaria (Couth). Lab.—Egg Hbr., 7 f. St. Pierre—5 f. N. S.—Browns Bk., 40 f.

L. pingelii (Beck). Lab.—Egg Hbr., 7 f. N. S.—70 f. 20 miles E. S. E. of C. Sable; Browns Bk., 49 f.

L. cancellata (Migh. and Ads.). Lab.—Egg Hbr., 7 f. N. S.—Browns Bk., 40 f.

L. cancellata var. *canadensis* Verr. & Bush. Lab.—Egg Hbr.

L. decussata (Couth). Lab.—Off Egg Hbr., 20 f. N. S.—70 f. 20 miles E. S. E. of C. Sable.

L. nobilis (Möll). Lab.—Egg Hbr., 7 ft.

L. scalaris var. *ccarinata* (Sars). Lar.—Komaktorvik Bay, 5 f.

L. rugulata (Möll). Lab.—Between C. Mugford and Hebron, 60 f.; Nain, 7 f.; Shoal Tickle, 25 f.; off Battle Hbr., 50 f.

L. impressa (Mörch). Lab.—Egg Hbr., 7 f.

L. harpularia (Couth). Lab.—Egg Hbr., 7 f.

L. exarata (Verr.) N. S.—20 miles E. S. E. of C. Sable, 70 f.; 43 miles W. by S. of C. Sable, 110 f.; 55 miles E. of C. Sable, 70 f.

L. incisula (Verr.). Lab.—Between C. Mugford and Hebron, 60 f.; off Egg Hbr., 20 f.; off Battle Hbr., 50 f. N. F.—Off St. Lawrence Hbr., 50 f. N. S.—20 miles E. S. E. of C. Sable, 70 f.

L. bicarinata (Couth). Lab.—Egg Hbr., 7 f. N. S.—Browns Bk., 40 f.

L. bicarinata var. *violacea* (Migh. and Ads.). Lab.—Shoal Tickle, 25 f.; Egg Hbr., 7 f. St. Pierre.—5 f. N. F.—Off C. Race, 30 f.

Retusa pertenuis Mich. Lab.—Between C. Mugford and Hebron, 60 f.; Egg Hbr., 7 f.; off Beachy I., 80 f.; off Battle Hbr., 50 f. N. S.—20 miles E. S. E. of C. Sable, 70 f.; 75 miles E. of C. Sable, 105 f.

Scaphander punctostriatus Migh. N. S.—20 miles E. S. E. of C. Sable, 70 f.

Cylichna alba Brown. Lab.—Off Fish I., 75 f. N. S.—55 miles E. of C. Sable, 85 f.

C. alba var. *corticata* Beck. Lab.—Between C. Mugford and Hebron, 60 f.; Shoal Tickle, 25 f.; Egg Hbr., 7 f.; off Beachy I., 80 f.

C. occulta Migh. Lab.—Between C. Mugford and Hebron, 60 f.; off Beachy I., 80 f.

Diaphana hiemalis Couth. Lab.—Between C. Mugford and Hebron, 60 f.; Egg Hbr., 7 f.

Philine lima Brown. Lab.—Between C. Mugford and Hebron, 60 f.; off Beachy I., 80 f.

P. cingulata Sars. N. S.—20 miles E. S. E. of C. Sable, 70 f.

P. sinuata Stimp. St. Pierre—5 f.

Limacina helicina Phipps. Lab.—20 miles E. of Nain, Aug. 15; off C. Harrison, tow net.

L. retroversa Flem. St. Pierre Hbr., Oct. 1.

Cleone limacina Phipps. Lab.—N. of Hebron; off C. Harrison, tow net.

Pelecypoda

Nucula delphinodonta Migh. & Ads. Lab.—Off Hebron, 100 f.; Port Manvers, 30 f.; Shoal Tickle, 20 f.; off Beachy I., 80 f.

N. tenuis (Montg.). Lab.—Off Hebron, 60 f.; between C. Mugford and Hebron, 60 f.; N. of Battle Hbr. 50 f. N. S.—20 miles E. S. E. of C. Sable, 70 f.

Leda minuta (Müll.(. Lab.—Off Hebron, 60 ft.; off Fish I., 80 f.; Port Manvers, 30 f.; Nain, 7 f.; Shoal Tickle, 20 f.; off Beachy I., 80 f.; Egg Hbr., 7 f. N. of Battle Hbr., 50 f.

L. pernula (Müll.). Lab.—Off Fish I., 75 f.; between C. Mugford and Hebron, 60 f.; off Beachy I., 80 f.; off Egg Hbr., 20 f.

L. tenuisulcata (Couth). N. S.—75 miles W. N. W. of Sable I., 75 f.; 55 miles E. of C. Sable, 85 f.; 20 miles E. S. E. of C. Sable, 85 f.

Yoldia myalis (Couth). Lab.—Off Fish I., 75 f.; between C. Mugford and Hebron, 60 f.; Nain, 7 f.; off Beachy I., 80 f. f. N. S.—14 miles S. of C. Sable, 45 f.; Browns Bk., 40 f.

Y. sapotilla (Gld.). N. S.—75 miles W. N. W. of Sable I., 75 f.; 75 miles E. of C. Sable, 105 f.; 55 miles E. of C. Sable, 85 f.; 20 miles E. S. E. of C. Sable, 70 f.

Y. thraciaeformis (Storer). N. S.—55 miles E. of C. Sable, 85 f.

Pecten islandica Müll. Lab.—Mettek I.; off Fish I., 80 f. N. F.—Off C. Race, 30 f. N. S.—Browns Bk., 40 f.; 14 miles S. of C. Sable, 45 f.

P. grandis Sol. N. S.—14 miles S. of C. Sable, 45 f.

Anomia aculeata Müll. N. F.—C. Norman, St. Pierre Bk., 30 f. N. S.—75 miles W. N. W. of Sable I., 75 f.; Roseway Bk., 45 f.; 14 miles S. of C. Sable, 45 f.; 49 miles W. by S. of C. Sable, 110 f.; Browns Bk., 40 f.

Mytilus edulis Linné. N. F.—C. Norman; Conche; Pilley's I.; Funk I.; mouth of Serpentine Riv.

Modiolus modiolus (Linné). N. F.—C. Norman; off Crew Pt., 17 f. N. S.—14 miles S. of C. Sable, 45 f.; Browns Bk., 40 f.

Musculus substriatus (Gray). Lab.—Off Hebron, 60 f.; off Fish I., 75 f.; between C. Mugford Hebron, 60 f.; off Beachy I., 80 f.; Gready Hbr., 12 f.; Egg Hbr., 7 f. N. F.—C. Norman. N. S.—14 miles E. of C. Sable, 45 ft.; 20 miles E. S. E. of C. Sable, 70 ft.; Browns Bk., 40 f.

M. nigra (Gray). Lab.—Off Fish I., 75 f.; between C. Mugford and Hebron, 60 f.; off Beachy I., 80 f.; Egg Hbr., 7 f. N. F.—Off C. Race, 30 f. N. S.—55 miles E. of C. Sable, 85 f.; 20 miles E. S. E. of C. Sable, 70 f.

Crenella faba (Müll.). Lab.—Nain, tide water.

C. decussata (Montg.). Lab.—Gready Hbr., 7 f. N. F.—Off St. Lawrence Hbr., 59 f.; St. Pierre Hbr., 5 ft. N. S.—20 miles E. S. E. of C. Sable, 70 f.; Browns Bk., 40 f.

C. glandula (Totten). St. Pierre Hbr., 5 ft. N. S.—14 miles S. of C. Sable, 45 f.

C. pectinula (Gould). N. S.—Browns Bk., 40 f.

Periploma fragilis (Totten). Lab.—Port Manvers, 30 f. N. S.—55 miles E. of C. Sable, 85 f.

Thracia myopsis Möll. St. Pierre Hbr., 5 ft. N. S.—75 miles E. of C. Sable, 105 f.; 55 miles E. of C. Sable, 85 f.; S. W. of C. Sable, 40 f.

Pandora glacialis (Leach). Lab.—Off Fish I., 75 f.; Shoal Tickle, 25 ft.; off Beachey I., 80 f. N. S.—14 miles S. of C. Sable, 45 f.

Lyonsia arenosa (Möll.). Lab.—Off Fish I., 75 f. N. S.—14 miles S. of C. Sable, 45 f.; Browns Bk., 40 f.

Cuspidaria glacialis (G. O. Sars). N. S.—75 miles W. N. W. C. Sable I., 75 f.

C. pellucida (Stimp.). N. F.—Off St. Lawrence Hbr., 50 f. N. S.—55 miles E. of C. Sable, 55 f.

Astarte borealis (Schum.). Lab.—Komatorvick Bay, 5 f.; off Hebron, 60 f.; Nain, 7 f.; Shoal Tickle, 25 f.; Egg Hbr., 7 f. N. F.—S. by E. of Burin, 110 f.; St. Pierre Hbr., 5 f. N. S.—E. of C. Sable, 30 f.

A. borealis var. *sericea* Posselt. Lab.—Off Fish I., 8 f.

A. arctica Gray. Lab.—Komaktorvick Bay, 5 f.

A. globosa Möll. Lab.—Egg Hbr. 7 f.; one mile N. Battle Hbr., 50 f.

A. elliptica (Brown). Lab.—Nain, 7 f.; Shoal Tickle, 25 f.; Egg Hbr., 7 f.; off Egg Hbr., 20 f. N. F.—Off C. Race, 30 f. St. Pierre Hbr., 5 f. N. S.—14 miles S. of C. Sable, 45 f.

A. subaequilatera Sowb. N. S.—75 miles E. of C. Sable, 105 f.; 55 miles E. of C. Sable, 85 f.; 40 miles W. by S. of C. Sable, 76 f.

A. subaequilatera var. *whiteavesii* Dall. N. S.—75 miles W. N. W. of Sable I., 75 f.; 20 miles E. S. E. of C. Sable, 70 f.; Browns Bk., 40 f.

A. undata Gould. N. S.—55 miles E. of C. Sable, 85 f.; 40 miles W. by S. of C. Sable, 76 f.; Browns Bk., 40 f.

A. castanea (Say). N. S.—40 miles W. by S. of C. Sable, 76 f.

A. striata Leach. Lab.—Shoal Tickle, 25 f.; Egg Hbr., 7 f.

A. fabula Reeve. Lab.—Off Hebron, 60 f.; off Fish I., 80 f.

A. crenata Gray. Lab.—Egg Hbr., 7 f.

Venericardia borealis (Conr.) Lab.—Off Hebron, 60 f.; off Fish I., 80 f.; Shoal Tickle, 25 f.; off Egg Hbr., 20 f. N. F.—Off St. Lawrence Hbr., 53 f.; off C. Race, 30 f. N. S.—55 miles E. of C. Sable, 85 f.

V. novangilae Morse. N. F.—Off C. Race, 30 f. N. S.—14 miles S. of C. Sable, 45 f.; 40 miles W. by S. of C. Sable, 76 f.; Browns Bk., 40 f.

Thyasira croulinensis (Jeff.). Lab.—Nain, 7 f.

T. plana (Verr. & Bush). Lab.—Shoal Tickle, 25 f.; off Beachy I., 80 f.; Egg Hbr., 7 f.; one mile N. of Battle Hbr., 50 f. N. S.—55 miles E. of C. Sable, 85 f.; 20 miles E. S. E. of C. Sable, 70 f.

T. gouldii (Phil.). N. S.—Browns Bk., 40 f.

Montacuta sp. St. Pierre Hbr., 5 f.

Cardium ciliatum (Fabr.). Lab.—Off Hebron, 60 & 100 f.; off Fish I., 75 f.; between C. Mugford and Hebron, 60 f.; Port Manvers, 30 f.; Nain, 7 f.; Shoal Tickle, 25 f.; off Beachy I., 80 f.; Egg Hbr., 7 f.; Gready Hbr., 12 f.; one mile N. of Battle Hbr., 50 f.; St. Pierre Hbr., 30 f.

C. pinnulatum (Conr.). St. Pierre Hbr., 5 ft. N. S.—49 miles W. by S. of C. Sable, 110 f.; Browns Bk., 40 f.

Serripes groenlandicus (Gmel.). Lab.—Komaktorvik Bay, 5 f.; between C. Mugford and Hebron, 60 f.; Nain, 7 f.; Shoal Tickle, 25 f.; Egg Hbr., 7 f. and off Egg Hbr., 20 f.

Macoma calcarea (Gmel.). Lab.—Off Hebron, 60 f.; off Fish I., 75 f.; between C. Mugford and Hebron, 60 f.; Port Manvers, 30 f.; Nain, 7 f.. Shoal Tickle, 25 f.; off Beachy I., 80 f.; Egg Hbr., 8 f.; one mile N. of Battle Hbr., 50 f. N. F.—St. Anthony: Pilley's I.; off C. Race, 30 f. N. S.—Roseway Bk., 45 f.; 20 miles E. S. E. of C. Sable, 70 f.

M. balthica (Linné). Lab.—Indian Hbr. N. F.—St. Anthony; Pilleys I.

Spisula solidissima (Dillw.). St. Pierre Hbr., 5 f.

Mesodesma arcuatum (Conr.). St. Pierre Hbr., 5 f.

Mya arenaria Linné. Lab.—Nain, 7 f.; Egg Hbr., 7 f. N. F.—Pilleys I.; Port Saunders. N. S.—Browns Bk., 40 f.

M. truncata Linné. Lab.—Off Hebron, 60 f.; between C. Mugford and Hebron, 60 f.; Nain, 7 f. N. F.—St. Anthony; off St. Lawrence Hbr., 53 f. N. S.—E. of C. Sable, 30 f.

Saxicava arctica (Linné). Lab.—Kangalaksiorvik Bay, N. of Nachvak, *fossil.* Between C. Mugford and Hebron, 60 f.; Nain, 7 f.; Shoal Tickle, 25 f.; Gready Hbr., 12 f.; Egg Hbr., 7 f. N. F.—C. Norman; St. Anthony; off C. Race, 30 f., young attached by byssus to *Pecten islandica.* St. Pierre Bk., 80 f. N. S.—14 miles S. of C. Sable, 45 f.; 40 miles W. by S. of C. Sable, 76 f.; Browns Bk., 40 f.

Panomya arctica (Lam.). Lab.—Off Fish I., 80 f.

Cyrtodaria siliqua (Speng.). Lab.—Off Beachy I., 80 f. St. Pierre Hbr., 5 f. (Young). N. S.—E. of C. Sable, 30 f.

Amphineura

Tonicelli marmorea (Fab.). Lab.—Gready Hbr., 12 f. N. F.—Off C. Race, 30 f. St. Pierre Bk., 30 f.

Trachydermon albus (Linné). Lab.—Gready Hbr., 12 f. N. F.—Off C. Race, 30 f. N. S.—40 miles W. by S. of C. Sable, 76 f.; 49 miles W. by S. of C. Sable, 110 f.

T. ruber (Linné). Lab.—Egg Hbr., 7 f.; Gready Hbr., 12 f.

Errata

In the first part of this paper, Vol. 39, pages 128 and 129 for Kowaktorvik Bay read Komaktorvik Bay; on pages 180 and 131 for Seldom Come Bay read Seldom-come-by; on page 341 for *Buccinum tottenis* read *B. tottenii.*

SPHÆRIIDÆ, PALEARCTIC AND NEARCTIC

BY V. STERKI

The Sphæriidæ, though somewhat inconspicuous and generally not much known, are a part of our fauna well worth consideration for their universal distribution and frequency, and the large numer of species and forms. They have been collected and studied mainly in Europe and North America, and a comparison of the two faunas is of interest. S. Clessin, in his Monograph of the Cycladidæ, has said that none of the American species are identical with European. That was evidently for the most part due to the fact that he had limited materials at hand. We know now that quite a number are the same, or closely related, thus adding their share to the evidence of a Holarctic fauna; and more may come to light when our continent is more fully explored, especially the vast expanse of Canada. The following list, though probably not complete, may be serviceable.

Pisidium Pfeiffer

P. amnicum Müller, Palearctic, and *virginicum* (Gmelin) Jenyns, Nearctic, are distinct as species, and partly rather different, but manifestly related, and represent a group or subgenus, including also *P. astartoides* Sandberger, fossil in Europe.

P. supinum A. Schmidt (*conicum* Baudon): widely distributed in Europe, also in our Northeast, apparently rather scarce; not easily identified, as it is much like forms of *compressum* Prime, which is the most widely distributed of our Pisidia.

P. henslowanum Sheppard, the same as in Europe, forms with and without ridges on the beaks; north-east, apparently not common.

P. steenbuchi Möller, has been cited repeatedly as occurring in the north-east: Greenland, Labrador, Ungava; I have seen no authentic specimens.

P. milium Held. A well-marked species and plainly identical, widely distributed on both continents, and variable in about the same way. From New England and New York to

Ontario, Michigan, Manitoba, to western Washington, also in the Rocky Mountains of Colorado, at high altitudes.

P. SUBTRUNCATUM Malm: in northern Europe; here apparently scarce within the regions explored; Winnebago Lake, Wisconsin, collected by Dr. F. C. Baker; Lake Nipigon, Ontario, by D. B. Adamstone.

P. ROSEUM Scholtz: originally known from Silesia. There have been some doubts whether it be a distinct species; apparently—rather: exactly—the same is in Maine, and similar forms probably not distinct, are at several places in New England, not referable to any other American *Pisidium*. This, by the way, should go far towards confirming the species.

P. PUSILLUM (Gmelin) Jenyns: a European species of rather wide distribution, and variable. Apparently the same has been seen from the mountains of Colorado, and from northern Indiana, distinct from other Nearctic species, so far as can be seen; probably it is also in Canada. A somewhat primitive form; its favorite habitats are shallow muddy springs and spring marshes, among grass and mosses.

P. PULCHELLUM Jenyns has been cited as from "Methy Lake, Athabasca" [now La Loche Lake, Saskatchewan], by Richardson; see Dall, Alaska Moll., p. 144. I have seen no specimens.

A few other species appear to be identical, but the materials at hand are not sufficient to make it certain.

P. FOSSARINUM Clessin, and *subrotundum* Sterki: History and discussion of this group would fill a small book; the following sketch may be of interest.

Palearctic: Under the name of *P. casertanum* Poli, English and French authors have comprised some quite different Pisidia. Principal among them are: (1) *casertanum* s. str., or what is taken for it, of southern to middle Europe, widely distributed and variable; rather the same are e. g. *sordellianum* Pini, *italicum* Clessin; forms and probably distinct species have been described under various other names. (2) *P. fossarinum* Clessin, in place of *fontinale* Pfeiffer, which is unidentifiable and had to be dropped, of middle and northern Europe and probably extending far into Asia. Their areas of distribution overlap, e. g. in France, Switzerland and no doubt eastward. *P. casertanum* s.

str. can be disregarded here except to say that Nearctic has no representatives of it, so far as known, and this fact is an additional reason for keeping them apart. *P. fossarinum* is a species decidedly variable, but rather representing a vast group of forms, many of them described under various names, some probably being distinct species.

Nearctic: *P. subrotundum* St., had to be separated as distinct from *abditum* Haldeman, a *mixtum compositum* as understood for many years. It is distributed, and common to abundant at many places from New England and New York to western Washington (not in the south, so far as known), from there to California and southward in the Rocky Mountains. It is decidedly variable, and some subspecies again show considerable variation, some of the forms being so different that they might be taken for distinct species. In short, it also represents a group, or cycle, of forms rather than a species in the current sense.

P. fossarinum and *subrotundum*, both in a narrower and wider sense, are manifestly related, apparently somewhat primitive and ancestral, and evidently had been diversified before the two continents became separated. Then, on each some of them persisted with slight changes, others differentiated with geological, climatic and local conditions into various forms, some of which appear to be or are now distinct species, and no doubt these processes are going on. To mention one example, there is a form of granitic soils in Europe exactly like specimens from the same kind of soil in New England, and other forms from both continents cannot be distinguished from each other. Why, then, not have the two under one species name? (the former would have priority).

With *fossarinum*, splitting on the one hand and excessive lumping on the other, have made the nomenclature all but inextricable; including *subrotundum* would merely make things more complicated. Besides, to express the real interrelations with names would necessitate many of them to be trinominal or quadrinominal. For the present at least it seems preferable to have them separate, with the understanding that they are parallel species, resp. groups. Also, the "head names" indi-

cate their respective homes, i. e. continents. Their case is not like that of *P. milium* for instance, which is plainly a species, even with considerable variation.

All of this is to show that *species* are not always concrete, clear-cut entities, and cannot be treated as such without violence. It is also, by the way, an example of the difficulties encountered in working with the Sphæriidæ. Thousands of specimens had to be revised and compared again and again in order to ascertain their standing and affinities, in this group alone.

Sphærium Scopoli

There are no species identical on the two continents. But of the subgenus *Corneola* Clessin, the Nearctic *S. tenue* Prime, of northern distribution, is related to the Palearctic *corneum* L., typical species; the latter is also in Lake Ontario, probably introduced.

The subg. *Sphæriastrum* Bgt. is represented only by *S. rivicola* Leach, of Europe. Clessin, in Cycladeen, p. 78, has ranged the North American *S. sulcatum* Lamarck under this group; manifestly a mistake: it belongs to the following.

Of the subg. *Cyrenastrum* there is only one species in Europe, *S. solidum* Normand, quite distinct from all of the Nearctic species.

Musculium Link (*Calyculina* Clessin)

The principal Palearctic species *M. lacustre* Müller, and *M. ryckholti* Normand, the latter of more northern distribution, are also Nearctic, and so is apparently a third; *M. lacustre* has been found in northern Indiana, and in Ontario (with the shells whitish); also near Duncan, British Columbia, large, fine specimens of rather different forms at the same habitat.

A number of perfect specimens from England, received as *M. lacustre*, and a lot from the vicinity of Berlin, Germany, only slightly different, are certainly distinct and rather exactly like a form of *truncatum* Linsley, from Ohio and Wisconsin. This species is widely distributed in North America, and very variable, but none of its forms can be mistaken for *lacustre*. That European form is possibly the same as *brochonianum* Bourguignat, of which I have no authentic specimens.

M. ryckholti is now known from New England to western Washington and British Columbia, also from the Rocky Mts., e. g. in Colorado, and is probably distributed all over Canada. There are very different forms, some exactly like European "varieties," others apparently representing distinct species, but additional materials are needed, as there may be intermediate forms. It appears that *M. raymondi* J. G. Cooper, from Oregon and Washington, is inseparably connected with *ryckholti.*

M. pallidum Gray, from England, is not distinct from the Nearctic *transversum* Say, and has probably been introduced.

EUPERA Bourguignat (*Limosina* Clessin)

E. singleyi Pilsbry, and possibly another species, are distributed along the Gulf coast. The genus is Neotropical, in the West Indies, Central and South America, also African: along the Mediterranean and in the South, so probably through the continent.

The fact that the genera are the same, and that quite a number of species, also groups and forms, of the two faunas are identical, or manifestly related, is one aspect of the problem of distribution. Another is that on each continent there are numbers of species distinct from the common Holarctic stock, and also from each other, in toto. This is in accord with other aquatic as well as land Mollusca, the Unionidæ and quite a number of Gastropod families. It must be stated that of Sphæriidæ, Nearctia has much larger numbers of species than Palearctia, so far as known; and their systematic relations, and distribution, present some complex problems, which may be discussed in another paper.

NOTES AND NEWS

DR. CHARLES C. ADAMS of the New York College of Forestry at Syracuse and well known to conchologists for his work on *Io*, on problems of distribution, etc., has been appointed Director of the New York State Museum at Albany.

Dr. H. Burrington Baker left Philadelphia June 10 for Vera Cruz, Mexico. He is to spend some months collecting mollusks chiefly in the northern part of the State of Puebla.

Helix nucleata Turton. In Man. Conch., XXVII, p. 192, under *Acanthinula aculeata*, Dr. Pilsbry has: "*Helix nucleata* Turton, according to Montagu, 1803. Apparently a typographical error for *aculeata*." In Turton's edition of Linné (A General System of Nature, &c., 1806) we find:

"*Helix nucleata.* Shell top-shaped umbilicate convex both sides, brown with prickly ribs; lip whitish. Mull. Naturf. 19, tab. 2, fig. i, ii, iii. Chemn. Conch. 9, tab. 133, fig. 1209. Inhabits woods of Denmark; $\frac{3}{4}$ of a line wide. Shell subpellucid, with 4 rounded whorls, on each of which are 20–30 whitish ribs; lip a little reflected and membranaceous; snail hyaline with blackish head and tentacula."

This is obviously *A. aculeata*, but as it stands, it must apparently be regarded as an emendation. Is it possibly *H. nucleata* in the reference to Müller given, which is not the ordinary one?

In the same book, p. 513, Turton states that *Helix pomatia* was introduced into England by Sir Kenelm Digby, for medicinal purposes. As the species has been found in Holocene deposits in the south of England, it must have existed there before the days of Sir K. Digby; yet it is possible that those we now find are descendants of his snails. As Taylor argues, however, it is more likely that *H. pomatia* has existed continuously in Britain from neolithic times.—T. D. A. Cockerell.

[Professor Cockerell having supplied the reference to *Helix nucleata*, which I had failed to trace to its source, I have looked up the references he quotes from Turton. In Der Naturforscher 19, p. 165 (1783), Müller refers to the description of *Helix aculeata* in his Historia Vermium. Chemnitz, in the Conchylien Cabinet, p. 153, quotes from Müller, giving the same name. He mentions the great rarity of spiny shells among land snails, and quaintly remarks of *H. aculeata:* "Nur schade dass sie sogar klein und fast unsichtbar ist." We still incline to the theory that "nucleata" was a printer's misreading of "aculeata," which was overlooked by Turton in the proof.

Most people who have published much have realized what extraordinary errors one sometimes overlooks.—H. A. P.]

It seems that the oystermen are importing "seed" oysters at Bellingham Bay, Wash., from Japan. Mrs. Oldroyd has sent me for identification four Japanese species from the Bellingham Bay oyster beds as follows:

Littorina mandshurica Schrenck.

Lampania cumingi Crosse.

Rapana thomasi Crosse.

Tritonalia japonica Danker.

The last, if it becomes acclimated, may prove a serious pest destroying young oysters.—W. H. Dall.

Since the publication of my article in the April issue, several references have been found relating to the correlation between the thickness of the shell in mollusks and the habitat, as is noted above. J. W. Taylor refers to this in his Monograph of the Land and Fresh Water Mollusca of the British Isles, Vol. I, 1894, p. 79: and also in the Journal of Conchology, Vol. V, April, 1888, pp. 296–7. Boycott refers to this also in the Proc. Malacol. Soc., Vol. XIV, pp. 166–7. I am indebted to Mr. J. R. le B. Tomlin for supplying me with this information.—Alan Mozley.

Truncatella *versus* Acmea.—In Proc. Malac. Soc. London XI, p. 332 (1915), Mr. Tom Iredale has revived the name *Acmea* Hartmann (Neue Alpina I, pp. 204–12, 1821) to replace *Truncatella* Risso, 1826.

Hartmann used the name *Acmea* first in his System der Erd- und Suesswasser Gastropoden Europa's, forming VI Abtheilung, 5 Heft of Sturm's Deutschlands Fauna 1821, which, according to Sherborn was published prior to the use in Neue Alpina (Index Animalium Pt. I, 1922, p. 40). In this work *Acme* and *Acmea* were used indifferently for the same genus, the former on the table facing p. 31, and on p. 37, while *Acmea* was used on pp. 48 and 49. On p. 49 a species, *Acmea lineata*

is first mentioned, and no other appears in the work. It is well defined by the generic diagnosis, in terms which exclude *Truncatella*.

From the above data it appears that *Acmea* Hartmann becomes a synonym of *Acme* Hartmann, and cannot be used for *Truncatella*.

As to the name *Fidelis* Risso, which Mr. Iredale mentions as having page-precedence of *Truncatella*, it is of even date with *Truncatella* Risso. In such cases the International Commission has ruled that "if two or more competitive names are of the same date, that selected by the first reviser shall stand." (Op. 40). This opinion concerned a case where page-precedence is also involved. *Fidelis* has never been used by subsequent authors, so far as I know. There seems no valid ground for resuscitating the name.—Pilsbry.

Snail pest at Deniyaya, Ceylon. "The Kalutara Snails (*Achatina fulica*) at Deniyaya were found in such overwhelming numbers that at a meeting of the Morowak Korale Planters' Association held on March 7, 1925, the question of its eradication was discussed. This subject was referred to the Director of Agriculture who detailed me to make an attempt to eradicate the pest by the prompt application of systematic control measures.

The collection of snails was begun on May 19, 1925; snails and egg masses were hand-picked and destroyed by immersion in a 7 per cent solution of copper sulphate. Tamil cooly boys were employed for this work. The next stage was sanitation, and nearly 16 acres in Deniyaya village, where snails were found most, were clean weeded and all refuse burnt.

Over 60,000 snails and egg-masses were destroyed, and an expenditure of Rs. 203/42 were incurred in the operation (Year Book of the Department of Agriculture, Ceylon, 1926, p. 62).

Eric Knight Jordan. We record with regret the death of this active and promising young naturalist, who was killed on March 10th, 1926, by the overturning of an automobile, while

on his way to a geological investigation of the Santa Monica region in southern California. He was born in San Francisco on September 27, 1903, the son of David Starr Jordan and Jessie Knight Jordan. He was graduated from Stanford University in 1923, his major subject being geology, with zoology as a minor. His chief publications have been on the Molluscan fauna of Trinidad Head, in California, written at the age of fifteen and published by the U. S. National Museum: "The Mollusks, Living and Fossil, of Lower California, and their Testimony as to Climatic Conditions in the Miocene Age; A List of the Fishes of Hawaii with notes and descriptions of new species (this in collaboration with D. S. Jordan) and 'Notes on the Fishes of Hawaii, with Descriptions of Six New Species,'" based on his own collection in 1924. In his youthful days, before entering the University, he had made a considerable collection of mollusks of California, and on various shores of Europe.

PUBLICATIONS RECEIVED

A Fresh-Water Snail, *Physa zionis*, Living Under Unusual Conditions. By H. A. Pilsbry (Proc. Acad. Nat. Sci., Phil. pp. 325–328, pl. XI and text figure, 1925). A species of *Physa* from Zion National Park, Utah, materially different from any other species hitherto described, and remarkable for its station in moist patches of algæ on vertical cliffs. Its very small size, extremely short spire and inflated body whorl make this species a unique one, especially among the western Physidæ. Differences in the animal, such as a broad foot, lack of mantle digitations, and the arrangement of the cusps on the teeth differentiate this species under a new subgenus, *Petrophysa*. The text figure by H. B. Baker, showing a central and a lateral tooth, is the finest that has appeared for *Physa*, and shows for the first time the exact position and formation of the lateral process found on all the lateral teeth.—W. J. Clench.

New Species of North American Ancylidae and Lancidae. By Bryant Walker. (Occas. Papers Mus. Zool., No. 165. Univ. Mich.). A paper of 12 pages and 3 plates, describing five new species.

Three New Species of Physa. By W. J. Clench. (Occas. Papers Mus. Zool., No. 168, Univ. Mich, 1926). In connection with the species described from the Hot Sulphur Springs at Banff, Alberta, the species recorded from the thermal waters of the Yellowstone National Park are discussed.

A New Lymnæa. By F. R. Latchford. (Canadian Field-Naturalist, vol. 40, p. 47, 1926.) This interesting species *L. laurentiana*, is found in Chilcott Lake, Masham, Ottawa Co., Quebec.

New fossil fresh-water Mollusks from Florida. By William B. Marshall (Proc. U. S. Nat. Mus., Vol. 68, 1926, pp. 1–4). *Lymnæa* (*Pseudosuccinea*) *barberi*, *L.* (*P.*) *aperta* and *Planorbis* (*Planorbina*) *preglabratus* are described from snails thrown from canals, West Palm Beach, thought to be Pliocene.

Notes on Distribution of Hawaiian Land Snails. By Dr. C. Montague Cooke (Proc. Pan-Pacific Sci. Congr., Australia, 1923, Vol. II, pp. 1545–1548). Data are presented of the distribution of the several families and genera. The author concludes: "The logical sequence of distribution of species, genera and families on the Hawaiian islands seems to show that these islands at one time formed a continuous land mass."

Veronicellidæ from British Guiana, and Anatomical Notes on American Helicinidæ. By H. Burrington Baker (Proc. A. N. S. Phila., 1926, pp. 29–56). In the second of these papers Baker investigates the pallial organs, intestinal tract and genitalia of *Hendersonia*, *Helicina*, *Alcadia*, *Lucidella*, *Emoda*, *Schasicheila*, *Stoastomops*, *Eutrochatella* and *Viana*. The anatomy of *Oligyra* was found to be quite distinct from that of

Alcadia, and closest to the subgenus *Tristramia* of *Helicina*, and he now ranks *Oligyra* as a subgenus of the latter. *Schasicheila* is one of the most aberrant groups in the Helicininæ.

Report on the Study and Appraisal of Mussel Resources in Selected Areas of the Upper Mississippi River 1920–25. By N. M. Grier. (Amer. Midland Nat., vol. 10, pp. 89–110, 1926).

Further Studies in Correlation of Shape and Station in Fresh Water Mussels. By N. M. Grier and J. F. Mueller. Bull. Wagner Free Inst. Science of Philadelphia, Vol. 1, No. 2–3.

Expedition of the California Academy of Sciences to the Gulf of California in 1921. Mollusca of the Family Triphoridae. By Fred Baker. (Proc. Calif. Acad. Sci., 4 ser., Vol. 15, pp. 223–239, pl. 24, 1926). Nine new species and one subspecies are described and figured.

Sur la position systématique du Genre *Erato*. By M. A. Vayssière (Comptes Rendus Acad. Sci., Séance du 18 Jan., 1926). Anatomic study of several species confirms the relationship of *Erato* to *Trivia;* these two genera forming a special section of the Cypræa family.

Paleontology of Coyote Mountain, Imperial County, California. By G. Dallas Hanna. Proc. Cal. Acad. Sci. (4), XIV, No. 18, March, 1926. The Tertiary beds of this mountain, which stands in the western part of the Colorado Desert, are considered to be for the greater part middle and upper Pliocene, and nowhere older than lower Pliocene. The list of fossils does not seem wholly congruous, characteristically eastern Miocene forms being enumerated, running up to recent western species; and Hanna remarks that "there appears to be good reason to suspect that more than one Pliocene formation is represented." The fossils are mainly in poor preservation, and it seems quite likely that some of the identifications may be challenged by other workers. However this may be, the paper is timely in calling attention to this interesting fauna. Ten new species are described, and with other important forms, illustrated on ten plates.—H. A. P.

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SEEKING LAND SHELLS IN CUBA

BY EDWIN E. HAND

The writer is in doubt whether to say "*Seeking* Land Shells in Cuba" or *Finding* Dr. Carlos de la Torre. But since the two subjects are practically synonymous, let it stand *as is.*

D. L. Emery, of St. Petersburg, Florida, commanded E. E. Hand of Chicago to park his car in his garage and join him and H. E. Lowe of Long Beach, California for a trip to Cuba. All necessary arrangements being duly perfected, three enthusiastic conchologists embarked on a sturdy boat at Port Tampa on July 8th bound for the port of Havana.

Next day found us located in a hotel home and 'phoning to Dr. Carlos de la Torre. A seven-passenger Kissel Car called for us next morning and we met the King of Cuban Conchology. He is fully worthy to be placed with Arango and Poey; for his knowledge of Cuban shells is simply stupendous—unbelievable. And even better than this he is so full of "the milk of human kindness."

We had numberless examples of his brotherly love for three strangers—yes, strangers except for the shell bond. But Charles Torrey Simpson told us an incident which nicely illustrates Dr. Torre's bubbling, overflowing friendliness. Mr. Simpson said, that Dr. Torre took him by both hands (or was

it shoulders?) and said, "You are Charles Torrey and I am Carlos Torre. We are brothers." And though our names are different we were treated just the same.

Our car stopped first at a tropical-fruit stand, where the host loaded up with good things too numerous to mention and treated us to our first green cocoanut milk sucked through a straw a la ice-cream soda. We also sampled mangoes and mama sapotes.

Then we drove out toward Loma de Candela and the sharp-eyed collector ordered the chauffeur to stop the car. Up and down that highway arched with century-old Ceiba and Ficus trees, we hastened knocking *Liguus* from the trunks and lower branches and seeking them in crevices where they were hiding. This was a treat never to be forgotten.

Then on again to the stone fences for *Urocoptis*, and further, at Guanabacoa a species of *Pleurodonte* planted by a collector years ago, having been brought from eastern Cuba. It may be worth while to say here that Dr. de la Torre had heard of this place, but had never visited it. So the quest was as exciting to him as to the rest of us. We drove up near the corner of the jail yard and the Doctor explained to some boys what he was looking for. The boys use these in playing games and some one was sure to know where to get them, but they knew nothing about it. Then on the diagonally opposite corner the same question was put to another group. Immediately one lad said, "Si, señor," and away he ran. In less time than it takes to tell it—he returned with a pocket full of the "caracolas"—*Pleurodonte marginella var.* Soon five grown men were scratching around a chicken yard to the bewilderment of all the hens. But we got a goodly mess and were soon homeward bound. We were about forty miles away from Havana. On the way out we stopped at a wayside inn for refreshments and returning, found at the same place an elegant course dinner, Spanish style, which the Doctor had quietly ordered as a surprise to us. This is a fair sample of all our days with Dr. Carlos de la Torre.

On these auto-collecting trips we ran to the coast betimes for Cerions, at Mariel, *Cerion johnsoni marielinum* galore, *C. chrysalis*, *C. salvatori*, etc., by the cigar-box full.

One day we went alone to Camoa or Jamaica and, though it was very hot and we spent a lot of our valuable time wiping sweat from our brows and "specs", we caught many *Chondropoma*, *Proserpina*, *Urocoptis*, *Eutrochatella*, *Megalomastoma*, *Helicina*, etc.

Over to Matanzas, via Hershey R. R. (yes, the chocolate man) we journeyed. Here we spent two days. One in a car furnished by Doctor Torre's brother Salvatore, collecting out by Belamar Caves and Point Sabanilla and the other with one of Dr. Torre's student assistants who took us through the Yumuri valley and Abra de Figueroa. Here *Chondropoma irradians* gave us a real thrill. It is a very beautiful species with wide flaring ruby-rayed lip. We found a few of variety *mahoganyi* —solid mahogany and well named. Many *Liguus*, on our return, rewarded our weary footsteps.

We did some marine collecting around Havana, finding *Littorina*, *Neritina*, *Tectarius*, *Fissurella*, etc. Our mentor, D. L. Emery, was poking about the Littorinas at the foot of the Prado, when he found amongst the plain brown, some speckled ones. We shall never forget the excitement six little speckled shells caused the good Dr. Torre. He looked at them carefully and exclaimed, "This is a new Littorina. This does not belong to Cuba. You are fooling me, Emery; you brought this from Tampa. A new land shell would be not surprising, but a new marine!" We all agreed it should be *emeryi* and rejoiced therein. But Doctor de la Torre was not to be caught napping and began to dig. In a few days he told us that he found, in a Porto-Rican list, undescribed and unfigured, a name that just fitted—*guttata*. After diligent searching by all of us and a student assistant, Mr. Lowe found two more.

At Guyabel we found a few of the rare Varicellas. They are carnivorous and feed on the Urocoptis, literally eating them alive.

We entrained for Guane, end of Railroad west, where Doctor Torre's letter brought us a fine reception and guides. We decided first to try for *Urocoptis elliotti* (See NAUT., May, 1908), so, a guide who knew where Bishop's Cave was located, took us there. We found no *elliotti* nor any place where we had to hang

on with all fours and pick with our mouth. So we decided to do some exploring ourselves. We worked around the other side of the Sierra de Guane and became "all tuckered out." Emery and Hand were resting but the indefatigable Lowe was high on the mountain side. We two had agreed that we wouldn't climb anymore for all the *U. elliotti* in Cuba. Soon Lowe called, "Found *elliotti* and lots of 'em!" We waited not, but hastened and gathered to our heart's content. And when we got back to the hotel and looked them over we decided they were not *elliotti!* Our guide had a horse to ford us back over the river. He took three at a time and made two trips. There were five of us and one sat down flat in the mud as we unloaded. But what did we care; we were having fun!

The next day we decided to go again, alone, and see what we could find. We went where no one had ever been collecting before and Dr. Torre says we found a new species. These will be worked up later.

One day, at Mendoza in the Sierra de Paso Real and the caves in the Mogote back of the railroad station, gave us a fine lot of "*dautzenbergiana*" and some new ones. We were all tired out again and went down to the station to wait for the train. We tried to buy a ticket but they refused to sell. They tried to tell us the train was two hours late. But beyond eats, drinks and sleeps, our Spanish was a negligible quantity. But we finally got the news and hiked the four kilometers to our hotel in one hour. We took the train back to Pinar del Rio, and a wonderful bus ride of about 18 miles brought us to Vinales. This was the finest mountain scenery yet and the Mogotes and Tumbadero looked magnificent. But the hotel, to which the Doctor had directed us, had gone out of business and we had the most primitive quarters. The one-story, tile-roofed, dirt-floored dining room gave easy access to the shed in back where the caballeros put their horses, leading them in and out through the dining room. We spent two days here, had fine collecting, and wanted to stay longer but our time was going so fast we had to be moving. We returned to Havana and spent two days with the Doctor's duplicates. Dr. Torre was amused that the very thing we sought in Guane, we missed. "But," said he,

"I have plenty of *elliotti* and will give you each a set." And so it was. And he gave us sets and sets, and we had to leave before he got through. But most highly prized of all he gave each of us a book entitled, "Geografia de la Isla de Cuba por Alfredo M. Aguayo y Carlos de la Torre y Huerta," and inscribed, "A guide for your future excursions and a souvenir from your friend, Dr. Carlos de la Torre." It is a book of 210 pages with many illustrations and is used in the schools of Cuba. Nearly all the places we visited are described and pictured.

In closing we give a few lasting impressions: The royal palms, dominant everywhere, the poverty of the people in the country, poor huts, dirt floors, naked children, pigs tied up to graze, drinking water hauled up from the river in a barrel and often standing in the sunshine. The kindness and hospitality of everyone, trying their best to do all in their power to guide and help you, "Americano" though you be. The highways are arched with acacias, ceibas, ficus, etc., underneath which your car glides through a shady tunnel; but from a height as you look back, you see the embowered road, a huge green serpent winding through the landscape.

It was a wonderful trip and long to be remembered, but we know three Americanos who are glad to be back in the U. S. A. And we all have his promise that Dr. Carlos de la Torre will visit us next time he comes hither. This promise and the shells we have will be an inspiration to us for years to come.

September 1, 1926.

THE NOMENCLATURE OF THE SUPERSPECIFIC GROUPS OF CORBULA IN THE LOWER MIOCENE OF FLORIDA

BY JULIA GARDNER[1]

Bruguière in 1798 published in the Encyclopédie Méthodique, a plate of eighteen figures which he headed *Corbula*. He used no specific names but his figures have been identified as follows:

[1] Published by permission of the Director U. S. Geol. Survey.

[2] Bruguière, J. G.: Tableau Encyclopédique et Méthodique, Paris, 1797, 1798.

1a–c.—*Corbula sulcata* Lamarck (=*Corbula guineensis* Muhlfeldt).

2a–c.—An indeterminate bivalve, probably a *Chama*.

3a–c.—*Corbula porcina* Lamarck. Not identified with assurance. Possibly a varietal form of *C. gibba* (Olivi) from the Mediterranean; more probably an exotic, cf. *C. acutangula* Issel, from the Red Sea. [1]

4a–d.—*Corbula nucleus* Lamarck (=*Corbula gibba* [Olivi]). Recent on the west coast of Europe and in the Mediterranean; Tertiaries of southern Europe.

5a–c.—*Corbula gallica* Lamarck. Eocene of the Paris Basin.

6a–b.—*Corbula margaritacea* Lamarck (=*Anatina trapezoides* Lamarck).

Lamarck determined most of the species on the original plate but cited no type. There is a reference to the plate in the Prodrome,[2] 1799, but no species is mentioned. The first specific list which appeared in the Systême,[3] 1801, included *Corbula sulcata*, *Corbula laevigata*, *Corbula margaritacea*, *Corbula gallica* and *Corbula striata*. *Corbula nucleus* was added in 1818 in the Histoire Naturelle.[4] There is apparently no record of the selection of a type before the anonymous publication of Lamarck's Genera of Shells in 1822. This publication was later fixed upon Children and in it, he definitely designated *Corbula nucleus* Lamarck (=*Corbula gibba* [Olivi]) as the type of the genus.[5]

This is at variance with the common usage and involves a realignment of the super-specific groups. The long synonymy of *Corbula gibba* testifies to its wide range and great variability. The type of the species according to Bucquoy, Dautzenberg and

[1] Bucquoy, E., Dautzenberg, Ph., Dollfus, Gustave F.: Mollusques marins du Roussillon, vol. 2, pp. 582, 587, 1896.

[2] Lamarck, J. B.: Mémoires Société d'Histoire Naturelle, Paris: Prodrome d'une Nouvelle Classification des Coquilles, p. 89, 1799.

[3] Lamarck, J. B.: Systême des Animaux sans Vertèbres, p. 137, 1801.

[4] Lamarck, J. B.: Histoire Naturelle des Animaux sans Vertèbres, vol. 5, p. 496, 1818.

[5] Children, J. G.: Quart. Jour. Sci. Lit. and Art, Roy. Inst., vol. xiv, p. 301, 1822.

Dollfus probably came from the Adriatic. The Mediterranean shells, as a rule, are not so large as those from the British waters. The species is characterized by the unequal, discrepantly sculptured valves; the right valve, the larger, relatively higher and more trigonal in outline, obtusely rostrate posteriorly, concentrically rugose; the left valve smaller, transversely elongate, not rostrate posteriorly, with a sparse and irregular radial lineation and the concentric sculpture restricted largely to the ventral area. These are the characters which, at least in the East Coast Tertiary and Recent faunas, have been commonly associated with *Aloidis*. Cossmann, Gray, and some of the other Europeans have included such forms under *Agina* Turton,[1] and have cited as the type of *Agina*, *Mya inæquivalvis* Montagu (=*Corbula gibba* [Olivi]). *Agina*, however, is monotypic and the type, *Mya purpurea* Montagu, is a *Saxicava*, probably *S. arctica* (Linnæus), so that *Agina* falls into the synonymy of *Saxicava* rather than of *Corbula*.

Aloidis Muhlfeldt[2] is also monotypic. The type, *Corbula sulcata* Lamarck, a recent shell from the coast of Senegal (figs. 1a-c on Bruguiere's original plate), has been considered by Gray,[3] Fischer,[4] Cossmann,[5] Bucquoy, Dautzenberg and Dollfuz, Woodring,[6] and others as the type of the genus *Corbula*. The species is not represented in the collections of the U. S. National Museum, but through the courtesy of the Academy of Natural Sciences, Philadelphia, the loan of good adult material has been obtained. The shell is large and coarse, the altitude

[1] Turton, Wm.: Conchylia Insularum Britannicarum, Dithyra, p. 54, 1822.

[2] Muhlfeldt, Megerle von: Magazin der Gesellschaft Naturforschende Freunde, 5 Jahr., Entwickelung eines neuen System der Schalthiergehaüse, p. 67, 1811.

[3] Gray, J. E.: Proc. Zoological Society, London, vol. xv, p. 191, 1847.

[4] Fischer, Paul: Manuel de Conchyliologie et de Paléontologie Conchyliologique, p. 1123, 1887.

[5] Cossmann, M.: Catalogue Illustré des Coquilles Fossiles de l'Eocene des Environs de Paris, App. 5, p. 15, 1913.

[6] Woodring, W. P.: Contributions to the Geology and Paleontology of the West Indies, Miocene Mollusks from Bowden, Jamaica: Carnegie Publication No. 366, p. 185, 1925.

of the right valve is 19.0 millimeters, the latitude 25.0 millimeters, the altitude of the left valve 15.5 millimeters, the latitude 23.0 millimeters, the diameter of the double valves 15.5 millimeters. The posterior keel is very sharp and defined posteriorly by a deep sulcus which persists from the nepionic shell to the margin. Both valves are coarsely rugose, the sculpture upon the right valve heavier than upon the left. Radial sculpture is absent upon the conch. The tips of the umbones are conspicuously capped by the nepionic valves which differ from the adult to a remarkable degree. They are nearly equivalve, compressed, acutely rostrate posteriorly, and similarly sculptured with concentric rugae which strengthen toward the ventral margin. These are characters which suggest the *Cuneocorbula* of common parlance rather than *Aloidis*. As a matter of fact, there are no East American shells sufficiently close to the large, coarse, Senegalese shell to suggest the representation of the *C. sulcata* group in East American waters either in Tertiary or in Recent times. The species formerly referred to *Aloidis* by American conchologists are included under *Corbula* s. s.

Caestocorbula Vincent,[1] type *Corbula henckeliusi* Nyst, is also a synonym of *Corbula* s. s. *Caestocorbula* was founded upon the supposed presence of a siphonal plate. The nature of the plate and the mode of attachment are not obvious from the description or the figure, but the plate is either quite foreign to the shell or a fortuitous character resulting possibly from some of the peculiar breakage phenomena that the Corbulae occasionally show.

Cuneocorbula[2] was erected by Cossman to include transversely elongated birostrate shells headed by *Corbula biangulata* Deshayes (Eocene of the Paris Basin) as the type of the subgenus. *Corbula biangulata* is a small thin shell, much produced posteriorly, strongly bicarinate, feebly and irregularly sculptured and with little more than generic characters to ally it with the forms with which it has been commonly associated by most of the

[1] Vincent, E.: Annales de la Societe Royale Zoologique et Malacologique, vol. 44, p. 141, 1910.

[2] Cossman, M.: Catalogue Illustre des Coquilles Fossiles de l'Eocene des Environs de Paris, vol. 1, p. 37, 1886.

American conchologists. There seems to be no subgenus available to which these small sub-equivalve, biconvex, transversely elongate, posteriorly rostrate, concentrically sculptured Corbulae, so common throughout the East Coast and Gulf Tertiaries and in the Recent East American waters, may be referred. A new subgenus, *Caryocorbula*, is proposed below for the accommodation of this group.

Bicorbula Fischer[1] is monotypic and the type is *Corbula gallica* Lamarck. Fischer accepted *Corbula sulcata* Lamarck as the type of the genus and established *Bicorbula* to include the large, subtrigonal, obtusely or not at all rostrate, and, for the most part, feebly sculptured shells. An obscure radial lineation is frequently developed on the right valve, more obvious, as a rule, in the decorticated shell. Dall and others who considered *Corbula gallica* as the type of *Corbula* s. s. could not, of course, recognize *Bicorbula* but if *Corbula gibba* is accepted as the type of *Corbula* s. s., *Bicorbula* must be reinstated.

Bothrocorbula Gabb[2] characterized by the deep lunular pit beneath the beaks, retains its status unchanged. The monotype is *Corbula vimínea* Guppy from the Miocene (Bowden Beds) of Jamaica.

The skeleton of the lower Miocene Corbulæ of Florida may then be defined as follows:

Corbula s. s.

Aloidis auctores: not *Aloidis* Mühlfeldt,[3] 1811. *Agina* Turton,[4] 1822. *Caestocorbula*, Vincent,[5] 1909.

Type.—*Corbula gibba* (Olivi) Recent on the west Coast of

[1] Fischer, Paul: Manuel de Conchyliologie et de Paléontologie Conchyliologique, p. 1123, 1887.

[2] Gabb, Wm. M.: Proc. Academy Natural Sciences Philadelphia, p. 274, 1872.

[3] Mühlfeldt, Megerle von: Magazin der Gesellschaft Naturforschende Freunde, 5 Jahr., Entwickelung eines neuen System der Schalthiergehaüse, p. 67, 1811.

[4] Turton, Wm.: Conchylia Insularum Britannicarum, Dithyra, p. 54, 1822.

[5] Vincent, E.: Annales de la Societe Royale Zoologique et Malacologique, vol. 44, p. 141, 1910.

Europe and in the Mediterranean; Tertiaries of southern Europe.

Shell rather small, inequivalvate, inequilateral, discrepantly sculptured even in the juvenile stages; the right valve, the larger, relatively higher and more trigonal in outline, obtusely rostrate posteriorly, concentrically rugose; the left valve smaller, transversely elongate, not rostrate posteriorly, with a sparse and irregular radial lineation and a concentric sculpture restricted largely to the ventral area.

Caryocorbula, new subgenus.

Cuneocorbula Dall et auctores: not *Cuneocorbula* Cossman, 1886.

Type.—*Corbula alabamiensis* Isaac Lea. Claiborne Eocene of the East Coast and Gulf from South Carolina to the Rio Grande.

Shell small or of moderate dimensions; acutely keeled posteriorly; slightly inequivalvate; the right valve a little larger and a little higher relatively than the left; both valves concentrically rugose, the sculpture upon the right valve in some species stronger and more regular than upon the left; a microscopically fine radial lineation developed in some of the later species, particularly upon the posterior keel; ligament, dental, muscle and sinal characters similar to those of *Corbula* s. s.

Caryocorbula includes the majority of the American species hitherto assigned to *Cuneocorbula*. *Caryocorbula* differs from the Paris Basin group in the less trigonal shell, not so produced posteriorly, usually heavier, uni- rather than birostrate and more strongly sculptured. *Caryocorbula* is abundantly represented in the Tertiary and Pleistocene deposits of the East Coast and Gulf and in the Recent East American waters.

Bicorbula Fischer.[1]

Type.—*Corbula gallica* Lamarck (Eocene of the Paris Basin).

Shell large, inequivalve; the right valve the larger and higher; the left valve ovate-trigonal in outline; posterior keel obsolete

[1] Fischer, Paul: Manuel de Conchyliologie et de Paléontologie Conchyliologique, p. 1123, 1887.

or obscure on both valves; concentric sculpture feeble and irregular; a fortuitous radial lineation frequently developed on the left valve, most obvious on the decorticated shell; ligament pit profound; anterior cardinal prominent, the posterior not developed; an incipient pallial sinus usually developed.

BOTHROCORBULA Gabb.[1]

Type.—*Bothrocorbula viminea* Guppy (Miocene of the Bowden beds of Jamaica).

Shell moderately large and heavy, transversely ovate in outline, slightly inequivalve, acutely rostrate posteriorly; a coarse concentric corrugation and an inconstant radial striation developed on both valves; deep lunular depression in front of the umbones, the characteristic feature of the group; hinge heavy but otherwise normal.

LAND SHELLS FROM AROUND FOUL RIFT, DELAWARE RIVER

BY E. G. VANATTA

During July and August, 1925 and 1926, Mr. James B. Clark collected the following species of land shells along both sides of a section of the Delaware River known as Foul Rift. It is interesting to note the presence of *Guppya sterkii* Dall in this region, also a specimen of *Polygyra tridentata* Say with two parietal teeth.

The following species were taken in Northampton County, Pennsylvania, near Foul Rift, N. J.:

Polygyra albolabris Say
Polygyra thyroides Say
Polygyra tridentata juxtidens Pils.
Polygyra hirsuta Say
Polygyra fraterna Say
Gastrocopta contracta Say
Gastrocopta pentodon Say
Gastrocopta corticaria Say
Vertigo gouldi Binn.
Cochlicopa lubrica Müll.
Polita hammonis Ström

[1] Gabb, Wm. M.: Proc. Academy Natural Sciences Philadelphia, p. 274, 1872.

Polita indentata Say
Euconulus fulvus Drap.
Guppya sterkii Dall
Pseudohyalina minuscula Binn.
Zonitoides arborea Say
Gastrodonta suppressa Say
Anguispira alternata Say
Helicodiscus parallelus Say
Punctum pygmæum Drap.
Succinea ovalis Say
Carychium exile Lea.

At Foul Rift, Warren County, New Jersey, Mr. Clark found the species listed below. The *Polygyra albolabris* Say from this place are rather small.

Polygyra albolabris Say
Polygyra thyroides Say
Polygyra tridentata juxtidens Pils.
Polygyra hirsuta Say
Polygyra fraterna Say
Gastrocopta armifera Say
Gastrocopta contracta Say
Gastrocopta pentodon Say
Omphalina cuprea Raf.
Euconulus fulvus Drap.
Guppya sterkii Dall
Pseudohyalina minuscula Binn.
Zonitoides arborea Say
Striatura milium Morse
Anguispira alternata Say
Helicodiscus parallelus Say
Punctum pygmæum Drap.
Succinea avara Say
Succinea retusa Lea var.
Carychium exile Lea.

On Scott's Mountain, Pohatcong Mountains, Warren County, New Jersey (about 9 miles S. S.-E. of Belvidere) the following forms were collected:

Polygyra albolabris Say
Polygyra thyroides Say
Polygyra tridentata juxtidens Pils.
Polygyra hirsuta Say
Polygyra fraterna Say
Gastrodonta suppressa Say
Polita hammonis Ström
Polita indentata Say
Zonitoides arborea Say
Striatura milium Morse
Punctum pygmæum Drap.
Carychium exile Lea.

FRESH-WATER MOLLUSCA FROM WHITE LAKE, OAKLAND COUNTY, MICHIGAN[1]

BY FRANK COLLINS BAKER

During July and a part of August, 1925, the writer spent his vacation on the little lake which lies west of the center of Oakland Co., about 15 miles west of Pontiac and 30 miles northwest of Detroit. The lake is one of the many glacial lakes so abundant in this county. It is about one and one-half miles long and three-quarters of a mile wide and has a maximum depth of 28 feet. There are two islands with woodlands, rather high above the surface, one at each end of the lake, and several shoal islands in the center which will sooner or later form one atoll-shaped island with a pool in the center. As this land has apparently not received a name I have christened it Pauline's Island, after my niece who assisted in making collections. The shores are rocky, with sand and gravel bottom in the exposed situations. Behind bars and points, which are numerous, the habitat is swampy and the bottom of mud. White Lake at present has no outlet, the water level having fallen below the old natural outlet, which is now built up with cottages and is called English Beach. To the east of the lake there is a dead lake which was once a third the area of White Lake. It was completely dry in July and August, 1925, the bottom being paved with dead shells. This lake and White Lake once had a common outlet to the south into the Huron River. The ecological features of the fauna and lake will be considered in more detail in another paper. As there will be some delay in the publication of that paper it may be of value to publish a list of the species collected in White Lake and vicinity, several being new records for this section of the state and one probably new record for the state.

[1] Contribution from the Museum of Natural History, University of Illinois, No. 38.

Species from White Lake

Lampsilis siliquoidea rosacea (DeKay).
Strophitus rugosus rhombicus (Anthony).
Anodonta grandis footiana Lea.
Anodonta marginata Say.
Sphaerium simile (Say).
Sphaerium acuminatum (Prime).
Musculium rosaceum (Prime).
Musculium securis (Prime).
Musculium truncatum angustatum Sterki.
Pisidium compressum Prime.
Pisidium adamsi Prime.
Pisidium medianum Sterki.
Pisidium scutellatum Sterki.
Pisidium rotundatum Prime.
Pisidium variabile Prime.
Pisidium tenuissimum Sterki.
Valvata tricarinata simplex Gould.
Valvata lewisii Currier.
Amnicola limosa porata (Say).
Amnicola oneida Pilsbry.
Amnicola walkeri Pilsbry.
Campeloma milesii (Lea).
Pseudosuccinea columella (Say).
Galba modicella (Say).
Galba exigua (Lea).
Helisoma antrosa unicarinata (Haldeman).
Helisoma pseudotrivolvis (Baker).
Helisoma campanulata (Say).
Gyraulus parvus (Say).
Menetus exacuous (Say).
Physa sayii Tappan.

Of the above, *Sphaerium acuminatum* is said by Sterki to be a distinct form but whether an extreme case of variation or a recognizable variety cannot at present be determined. *Musculium truncatum angustatum* appears to be the lake manifestation of *truncatum*. *Amnicola oneida* is the first published record for Michigan. The specimens have been compared with type material from Oneida Lake, N. Y. *Campeloma milesii* has been verified by Walker. *Helisoma pseudotrivolvis* occurred in swampy or quiet water habitats behind bars, where vegetation was abundant and the bottom of soft mud. This species differs from *trivolvis* in both genitalia and radula.

Dry lake east of White Lake. As already stated, this lake bed is dry and the bottom will soon be meadow land. It is bordered by Typha and the bottom is covered with the large leaves of the yellow lily, Nymphaea, indicating that the water table is at present not far below the surface. Eight species were found on the dry bottom, three of which did not occur in White Lake. These are marked with an * in the list.

Pisidium subrotundum concinnulum Sterki.*
Musculium rosaceum (Prime).
Musculium securis (Prime).
Galba parva (Lea).*
Helisoma antrosa unicarinata (Hald.).
Helisoma campanulata rudentis (Dall).*
Physa sayii Tappan.
Menetus exacuous (Say).

Rudentis is like specimens from Canada and from other parts of Michigan. It is an interesting fact that typical *campanulata* inhabits White Lake while *rudentis* was found only in this extinct lake. The form may be an ecological one, the habitats in Wisconsin pointing in the same direction.

Wood-land pool in kettle hole in woods east of White Lake. This pool is in a deep depression and is overgrown with button-bush. The water in August was but a foot deep in the deepest part and the bottom consisted of soft, sticky mud. Two species were abundant.

Musculium truncatum (Linsley). *Pisidium strcatori* Sterki.

In a tamarack swamp south of White Lake there are many summer-dry pools containing sometimes a few inches of water in summer. In these, three species were abundant.

Sphaerium occidentale (Prime). *Planorbula armigera* (Say).
Aplexa hypnorum (Linn.)

In a small stream flowing through the swamp a form of Physa was found believed to be *gyrina* but not of the *hildrethiana* form. The stream was never dry and was quite a sizeable brook in the wet season.

In a small brook at the foot of the hill east of the village of Highland a number of mollusks occurred. This is a cold, clear stream of small size, filled with vegetation, the bottom varying from mud to sand, the water shallow.

Sphaerium stamineum (Con.)
Campeloma rufum (Haldeman)
Pisidium subrotundum concinnulum Sterki
Physa michiganensis Clench.

The outlet of Grass Lake is a cold stream which has cut a bed three or four feet below the level of the adjacent land. The bottom is usually hard sand or gravel, silty in places. The

current is moderately swift and the water varies from a foot to about three feet in depth. It drains into the Huron River.

Pisidium subrotundum concinnulum Sterki
Pisidium neglectum Sterki
Sphaerium striatinum (Lam.)
Galba exigua (Lea)
Physa michiganensis Clench

The *Pisidium concinnulum* of the streams is said by Sterki to be different from the form found in the dry lake. They are much smaller. This is no doubt true, because a species or variety would scarcely be identical living in two such habitats as a cold, rapid brook and a shallow, quiet lake.

My thanks are due Dr. V. Sterki for the identifications and notes on the Sphaeriidae, Dr. Bryant Walker for assistance in determining the Campeloma and Unionidae, and Dr. Samuel Henshaw, Director Museum of Comparative Zoology, for loaning material in the Anthony collection in that institution.

NOTE ON DONAX CONRADI DESHAYES

BY J. R. LE B. TOMLIN

One of the common species of *Donax* on the Californian coast is usually known, so I gather from recent literature, as *D. conradi* Deshayes. I showed Mrs. Oldroyd the types of this species a few weeks ago and she was inclined (from memory only) to doubt whether it is the shell called *conradi* in California. However that may be, the object of the present note is to point out that there is an earlier name than *conradi* to be used.

D. conradi was described in Proc. Zool. Soc. London, 1854, p. 351, but the part was not actually published until May 16, 1855, and meanwhile Reeve had begun the issue of his monograph of *Donax* in vol. VIII of the "Conchologia Iconica."

I have before me the types of *conradi* Desh. and *contusus* Reeve—the latter described and figured on pl. IV, species and fig. 24, Sept., 1854—and they unquestionably belong to the same species.

Owing to the tardy publication of the P. Z. S. in the first half of the fifties this fate has unfortunately befallen many of Deshayes' new names. I have already pointed out their wholesale massacre in the *Mactridae.*[1]

Two other species of *Donax*, described by Reeve from the Hanley collection, are also synonymous with *contusus:* the types of both are also before me—they are:

D. vellicatus Reeve, pl. ix, sp. and fig. 66 and *D. bitinctus* Reeve, pl. ix, sp. and fig. 68, both dating from June, 1855.

It may be noted that Reeve erroneously gives his specific names in *Donax* the feminine gender, the word δόναξ being masculine.

PRELIMINARY LIST OF THE MOLLUSCA OF JASPER PARK, ALBERTA

BY ALAN MOZLEY

University of Manitoba

The molluscs listed below were collected in Jasper National Park, Alberta, during the summer of 1925. This area is situated at about 53° N. Lat. and 118° W. Long. and is thus in the Rocky Mountains about three hundred miles north of the International Boundary. The elevation of the area collected over is between 3000 and 7000 feet and the lakes and streams examined all belong to the Mackenzie River drainage system. The life-zones present in this district are the Canadian, Hudsonian and Arctic Alpine, the tree line being as low as 6500 feet. The Transition Zone apparently does not occur, even in the bottoms of the valleys. Three terrestrial species were found within the Arctic Alpine, namely, *Euconulus chersinus polygyratus* Pils., *Vitrina limpida* Gould, and *Gonyodiscus cronkhitei anthonyi* Pils. These species, however, are by no means confined to this zone. The only previous mollusc records from this northern district are those of Baker (Bull. Amer. Mus.

[1] Journ. of Conch., xvii, p. 134.

Nat. Hist., Vol. XIII, pp. 527–539) from Brazeau[1] River and Lake, Alberta, which is in the Hudson Bay drainage. Considerable information relating to the habitat preferences and other phases of the ecology of these forms was collected, but is reserved for a future paper after additional observations have been made. It is thought that as no collecting has been done previously in this area of the Mackenzie basin in the mountains the present list is worthy of placing on record. I am indebted to Drs. Bryant Walker, Victor Sterki and F. C. Baker for aid in the determination of this material.

Gastropoda

Family Pupillidae

Vertigo modesta (Say). Signal Mountain, 4000 feet; near Cabin Creek.

Vertigo ovata Say. Lake between Patricia and Pyramid Lakes; near Hibernia Lake.

Columella alticola (Ing.). Signal Mountain, 4000 feet.

Family Zonitidae

Vitrina limpida Gould. Signal Mountain, 6700–7000 feet; north of Mount Edith Cavell, 6600 feet; creek from Lake Marjorie.

Polita hammonis (Strom.). Cabin Creek; creek from Lake Marjorie.

Polita binneyana (Morse). Creek from Lake Marjorie.

Euconulus chersinus polygyratus Pils. Cabin Creek; Signal Mountain, at 4000 feet, and within Arctic Alpine at 6700–7000 feet; Caledonia Creek.

Zonitoides arborea (Say). Unnamed lake one mile directly north of Geikie, Alta.

Family Endodontidae

Gonyodiscus cronkhitei anthonyi Pils. Creek from Lake Marjorie; Signal Mountain, 4000 feet, and 6700–7000 feet; Cabin Creek; near Geikie.

[1] In Baker's paper the locality was given as "Brazean"; Mr. Baker informs me that this was a typographical error, the shells actually being from Brazeau River and Lake.

Family Succineidae

Succinea retusa Lea. Unnamed lake north of Geikie.

Succinea avara Say. Unnamed lake north of Geikie.

Succinea vermata Say. Near Lake Edith; unnamed lake north of Geikie.

Family Lymnaeidae

Lymnaea stagnalis appressa Say. Lakes Marjorie, Pyramid, Mildred, Wabasso.

**Lymnaea emarginata canadensis* Sow. Lake Edith; Twin Lake, near Medicine; Lake between Patricia and Pyramid Lakes.

**Lymnaea traskii* Tryon. Twin, Wabasso, Edith and Maligne Lakes.

Lymnaea obrussa decampi St. Lakes Edith, Caledonia, Mildred. In stomach of a Dolly Varden trout (Salvelinus parkei Suck.) from Jacques Lake.

**Lymnaea parva sterkii* Baker. Creek running from Jacques Lake.

**Lymnaea dalli* Baker. Lake between Patricia and Pyramid Lakes; unnamed lake north of Geikie.

Family Planorbidae

Planorbis exacuous Say. Lakes Hibernia, Marjorie, Iris and the larger Trefoil Lake. Unnamed lake north of Geikie.

Planorbis hirsutus Gould. Lake between Patricia and Pyramid Lakes.

Planorbis parvus Say. Lakes Hibernia, Mildred, Patricia, Edith, Annette, Wabasso, Pyramid, and the larger Trefoil Lake. In stomach of Rainbow trout (Salmo irideus Gibb.) from Wabasso Lake.

**Planorbis crista* Linne. Virl and the smaller Trefoil Lakes.

Family Physidae

Physa heterostropha Say. Lakes Edith, Annette, Virl, Dorothy, Caledonia, Mildred, Pyramid.

Physa gyrina Say. Lakes Marjorie and Mildred.

Physa sp. Wabasso Lake, in stomach of Rainbow trout (Salmo irideus Gibb.).

Family Ancylidae

**Ancylus hendersoni* Walker. Lake Iris, altitude 4285 feet.

Family Valvatidae

Valvata lewisi Curr. Hibernia, Mildred, and Patricia Lakes.

Pelecypoda

Family Sphaeriidae

Pisidium compressum Prime. Unnamed lake north of Geikie.

**Pisidium variabile brevis* St. Lakes Caledonia and Hibernia.

Pisidium scutellatum St. Lake Patricia.

**Pisidium roperi* St. Lake between Patricia and Pyramid Lakes.

**Pisidium tenuissimum* Prime. Edith and the larger Trefoil Lake. Unnamed lake north of Geikie.

**Pisidium rotundatum* Prime. Larger Trefoil Lake; lake between Patricia and Pyramid Lakes.

Those species marked with an asterisk are recorded for the first time from the Mackenzie River drainage. The discovery of *Ancylus hendersoni* Walker, in this region is of some interest, since this genus, in its modern usage, has only once been recorded from the North American continent. The previous record being from Eldora Lake, Boulder Co., Colo. (Occ. Papers, Mus. Zool., Univ. Mich., No. 165, 1925.) Dr. Walker very kindly identified this species for me.

SOME MOLLUSKS FROM WESTERN CANADA

BY ALAN MOZLEY

University of Manitoba

In the course of an investigation into the constitution, origin and ecology of the mollusk fauna of the northern part of North America, a list was made of the species in my collection from the Transition life-zone. Since this list includes a number of species which have never been recorded from this region, considerably extends the known distribution of others, and gives

precise localities of ecological value, it has been thought worth while to publish it. The collecting was done wholly within the Hudson Bay drainage. A number of species are recorded from Indian Bay station, Manitoba. This is situated on the extreme eastern boundary of the Transition Zone, and a number of eastern and northern species occur at this point.

As is well known the Transition Zone includes southwestern Manitoba and a large part of central Saskatchewan and Alberta. This is a flat plain, having no outcrops of bedrock, such as characterize the Canadian Zone to the east. As a result of the conformation of the land, what lakes are now in existence are shallow. Lake Winnipeg, the largest lake in the region, is about two hundred and fifty miles in length. Grand Beach, Victoria Beach, and Matlock, where some collecting was done, are situated on the southern shore of this lake. In addition there are numerous other standing bodies of water, including sloughs and pond-like lakes, the northern end of Pelican Lake, Ninette and Jackfish Lake (Township 18, Range 8 east of the Principal meridian) belong to the latter type. The rivers of this region are usually of a slow meandering type. As regards the vegetation, this is an area of transition between the northern forested region and the dry southern plains. The forest cover is typically deciduous poplar (*P. tremuloides*) predominating.

At Indian Bay, Manitoba (also called Waugh), an effort was made to obtain a sample of the mollusk fauna from as many terrestrial habitats as possible. The results seem to show that, in this district at least, the local distribution of the terrestrial forms is affected not so much by the character of the forest cover as by the available moisture. Two small islands in Indian Bay were examined, and it is of interest to note that the larger of the two, about one hundred yards in length, had a terrestrial mollusk fauna essentially the same as that found on the mainland. The smaller island was less than half the size of the other and much dryer, with the result that species having some tolerance of comparative dryness, particularly *Vallonia costata* Müll, predominated.

For simplicity in this preliminary list, the classification used

by Dall (1) has been adopted with certain modifications. New records for each province are indicated by an asterisk. I am indebted to Drs. Bryant Walker, Victor Sterki and P. C. Baker for aid in the determination of many of these shells, and to Miss Ruby Bere and Mr. R. D. Bird for the collection of certain shells.

Gastropoda

Family Helicidæ

Vallonia costata (Müll). Manitoba: Indian Bay station; St. Vital; Selkirk; Treesbank; Ninnette, in the Tiger Hills, and along the shores of Pelican Lake; Beulah Birtle.

*Saskatchewan: Theodore, shore of Whitesand River. *Alberta: Edmonton.

Family Pupillidæ

Vertigo gouldii (Binney). *Alta: Edmonton, willow habitat south of Saskatchewan River.

Family Cochlicopidæ

Cochliopa lubrica (Mull.). Man.: Indian Bay station; Winnipeg; between Navin and St. Vital; Grand Beach; Birds Hill; Treesbank; Ninette; Birtle.

Family Zonitidae

Vitrina limpida Gould. Man.: Indian Bay station; Aweme.

Vitrea hammonis (Strom). Man.: Ninnette.

Euconulus fulvus (Drap.). *Alberta: Edmonton.

Zonitoides nitida (Mull.). Man.: Birtle.

Zonitoides arborea (Say). Man.: Indian Bay station; Ninnette. Alta.: Edmonton.

Zonitoides exigua (Stimp.). *Man.: Ninnette.

Family Endodontidae

Pyramidula cronkhitei anthonyi Pils. Man.: Indian Bay station; St. Vital; Birds Hill; Grand Beach; Treesbank; Ninnette; Birtle. Alta.: Edmonton.

Punctum pygmaeum (Drap.). *Alta.: Edmonton, on the banks of the Saskatchewan River.

Family Succineidae

Succinea hawkinsii Baird. Man.: Ninnette, near Round Lake; Birtle.

Succinea avara Say. Man.: Grand Beach; Ninnette; Beulah; Birtle.

Succinea ovalis Say. Man.: Indian Bay station; Winnipeg; Selkirk; Grand Beach; Matlock; Aweme; Ninnette; Birtle.

Family Lymnaeidae

Lymnaea stagnalis appressa Say. Man.: Indian Bay station; Winnipeg, Sturgeon Creek; St. Norbert, La Salle R.; Lockport; Clandeboye, Muckle Creek; Grand Beach, the Grand Marais; Jackfish Creek near Jackfish Lake; Victoria Beach; Treesbank; Souris River; Baldur, slough near Cobbs Lake; Ninnette, marsh at northern end of Pelican Lake, slough five miles north of Ninnette; Douglas Lake, near Onah. Sask.: Theodore, Powells Lake; Ingebright, which is between Swift Current and Medicine Hat.

Lymnaea caperata Say. Man.: Ninnette, marshy area at northern end of lake, abundant in hay meadow between Pelican and Round Lakes.

Lymnaea umbilicata C. B. Adams. *Man.: Birtle, small marsh along edge of Birdtail Creek. This species is recorded from the Hudson Bay drainage for the first time. Determination by Baker.

Lymnaea parva sterkii Baker. Man.: Birtle, small marsh along the edge of Birdtail Creek. Recorded from the Hudson Bay drainage for the first time.

Lymnæa parva Lea variety. Man.: Ninnette, wet portion of the hay meadow between Round (also known as Square) and Pelican Lakes.

Lymnæa dalli Baker. *Man.: Victoria Beach. This species occurs in a number of situations in the marsh on the western side of the peninsula at the neck. This has only been recorded twice before from Canada, see Huntsman (2, p. 8) and Mozley (3).

Lymnæa lanceata Gould. *Man.: Indian Bay station. This species was abundant in certain portions of a marsh at mile 65,

G. W. W. D. Ry., containing Typha and the calla lily (Calla palustris). Recorded from the Hudson Bay drainage for the first time.

Lymnæa humilis modiocella Say. Man.: Ninnette, near Round Lake.

Lymnæa obrussa exigua Lea. Man.: Indian Bay station, on protected shore in Indian Bay. St. Norbert, La Salle River; Balsam Bay, creek running into the Grand Marais, two miles east of Balsam Bay station; Ninnette, near Round Lake, immature, identity somewhat doubtful.

Lymnæa palustris (Mull.). Man.: Indian Bay station, found in one habitat only, a small stagnant pool; Winnipeg, Catfish Creek; St. Vital; St. Norbert, La Salle River; Clandeboye, Muckle Creek; Goldeye Lake, near mouth of Red River; Matlock; Balsam Bay, small pond on creek running into the Grand Marais, two miles east of Balsam Bay station; Jackfish Lake, and creek; Steep Rock; Aweme, slough near tamarack swamp; Ninnette, commonly along marshy shores, Pelican Lk.; Some of the Ninnette shells were near *blatchleyi* Baker. Sask.: Theodore, Whitesand River. Alta.: Edmonton, abundant in sloughs south of Edmonton.

Lymnæa vehlii "Beck" Moll. *Man.: Victoria Beach. Small shallow Bay on shore of Traverse Bay, one mile south of Elk Island; Ninnette, in the somewhat more open portions of the marsh at the northern end of Pelican Lake; identity somewhat doubtful; Birtle, Birdtail Creek, some of these specimens were near *pingelii* "Beck" Moll.

Lymnæa vahlii arctica Lea. *Man.: Grand Beach.

Lymnæa catascopium Say. Man.: Victoria Beach, abundant on an exposed boulder shore on the northwest side of the peninsula.

Lymna emarginata Say. Man.: Victoria Beach.

Family Planorbidae

Planorbis antrosus Conrad. Man.: Birtle, Birdtail Creek, some shells approaching *portagensis* Baker.

Planorbis antrosus striatus Baker. *Man.: Indian Bay station, Falcon Bay.

Planorbis campanulatus variety. Man.: Indian Bay station; Falcon Bay, amid a thick bed of *Zizania* and *Utricularia;* Snake Lake, on *Zizania.* These shells belong to a new variety shortly to be described by Miss M. L. Winslow of the Museum of Zoology, University of Michigan.

Planorbis exacuous Say. Man.: Indian Bay station, Falcon Bay, Snake Lake; Grand Beach; Douglass Lake near Carberry.

Planorbis hirsutus Gould. Man.: Indian Bay station, Falcon Bay, among *Zizania* and *Utricularia;* Jackfish Creek near Jackfish Lake; Victoria Beach marsh at the neck of the peninsula.

Planorbis deflectus Say. *Man.: Jackfish Lake; Victoria Beach, pond in interior of the peninsula.

Planorbis parvus Say. Man.: Indian Bay station; St. Norbert, La Salle River; Red River, below Selkirk; Goldeye Lake, southeast of Netley; Muckle Creek, near Clandeboye; Treesbank; Souris River; Douglas Lake, near Onah; Victoria Beach; Balsam Bay, creek running into the Grand Marais, two miles east of Balsam Bay station; Jackfish Creek, near Jackfish Lake; Ninnette, Pelican Lake. Sask.: Theodore, Whitesand River. Alta.: Edmonton, sloughs south of this city.

Planorbis umbilicatellus Cockerell. Man.: St. Vital.

Segmentina armigera Say. Man.: Grand Beach, the Grand Marais; Ninnette, northern end of Pelican Lake. The previous records of this species from Manitoba must be treated as doubtful, as they may refer to the more recently described *crassilabris* Walker.

Segmentina christyi Dall. Man.: Beulah, Wade's slough.

Segmentina crassilabris Walker. Man.: Arnaud; Balsam Bay, small pond in creek running into the Grand Marais, two miles east of Balsam Bay station.

Family Physidae

Physa heterostropha Say. Man.: Winnipeg, Sturgeon Creek.

Physa gyrina Say. Man.: Ninnette, the dominant mollusk among the dense growth of *Potamogeton* throughout the northern end of Pelican Lake.

Physa gyrina hildrethiana Lea. *Man.: Winnipeg, Catfish Creek.

Physa integra Halc. Man.: Clandeboye, Muckle Creek; Grand Beach, the Grand Marais; Victoria Beach; Birtle, Birdtail Creek.

Family Ancylidae

Ferrissia rivularis Say. Man.: Birtle, Birdtail Creek.

Family Auriculidae

Carychium exile H. C. Lea. Man.: Ninnette.

Family Valvatidae

Valvata tricarinata Say. Man.: St. Norbert, La Salle River; Clandeboye, Muckle Creek; Victoria Beach; Treesbank, Souris River. Sask.: Theodore, Whitesand River.

Pelecypoda

Family Sphaeriidae

Sphaerium sulcatum Lam. *Sask.: Theodore, Whitesand River.

Sphaerium acuminatum Prime. *Man.: Victoria Beach.

Sphaerium tenue Prime. Man.: Victoria Beach, small shallow inlet on the shore of Traverse Bay, one mile from Elk Island. Sterki (4, p. 438) apparently does not consider the records quoted by Dall (1, p. 139) sufficiently authenticated to consider.

Musculium transversum Prime. Man.: Matlock.

Musculium truncatum Linsley. Man.: Victoria Beach, marsh at mile 68.8.

Musculium ryckholti Normand. *Man.: Victoria Beach, marsh at mile 68.8; Ninnette, slough one mile northeast of Ninnette Sanitorium.

Pisidium compressum Prime. *Man.: Birtle, Birdtail Creek. *Sask.: Theodore, Whitesand River.

Pisidium fallax St. *Sask.: Theodore, Whitesand River.

Pisidium roperi St. Man.: Victoria Beach, marsh at mile 68.8. Sterki (4, p. 458) records this species from "Manitoba" but fails to state any precise locality.

Pisidium subrotundum Sterki. *Man.: Ninnette, slough one mile north of Ninnette Sanitorium.

List of References

1. Dall, W. H. Harriman Alaska Expedition, XIII, Land and Fresh Water Mollusks, 1905.
2. Huntsman, A. G. The Quill Lakes of Saskatchewan and their Fishery Possibilities. Contributions to Canadian Biology, N. S., Vol. 1, No. 9.
3. Mozley, Alan. Preliminary List of the Mollusca of Jasper Park. Nautilus, Oct., 1926.
4. Sterki, Victor. A Preliminary Catalogue of the North American Sphæriidæ. Ann. Carnegie Mus. X, 1916.

CORRESPONDENCE FROM MEXICO

After a week of good collecting at Cordova, Dr. H. Burrington Baker proceeded to Necaxa in the State of Puebla where he made his headquarters at the plant of the Mexican Light and Power Co. Here he was laid up for a time.

"Before indulging in my rest, I pressed the snails rather hard for four weeks, so have a pretty fair series of samples of the fauna around Necaxa, although I would have liked to get in more than one day at my lowest level, 675 meters (2230 ft.). The mesa of Necaxa with the residences of the officials and the club is at about 1360 meters (4490 ft.), while the hills nearby go up quite rapidly to 1725 meters (5700 ft.). Just opposite the mesa, the remnants of the dammed Rio Necaxa takes two jumps in order to reach a level of about 900 meters (2970 ft.). The narrow gauge railway from Beristain only runs once a week so could not use it much, but an inclined railroad drops from the mesa down to the bottom of the falls several times a day, so I got in quite a lot of work between 800 and 1700 meters. The mesa and its surroundings are basalt, but the hills and the lower canons (below the basalt) are highly metamorphosed shales and dirty limestones.

I feel fairly sure of the following genera from around Necaxa; I think I sent you a list of those caught at Cordoba.

Helicina, 3 or 4 species.

Schasicheila at least 2 species.

Aperostoma (Habropoma auct.), a beautiful little species less than half the size of *A. salleanum*.

Physa was the only fresh-water shell seen. The big streams were in flood and opaque; small streams with nothing but caddisfly larvæ.

Carychium, the most abundant shell.

Strobilops, lots of them.

Pupisoma abundant; either 2 species or 2 genera (*Acanthinula*).

Pupillidae, three toothed species, I think.

Caecilioides and maybe *Coilostele.*

Punctum (?) Sure looks like it under hand lens.

Radiodiscus, was on tree trunks; also a little red species that I cannot place as to genus.

Pycnogyra, plenty.

Microconus, not surely recognized on account of low power of lens. Got a conical shell that looks something like it but is all hairy.

Omphalina, *ss.*, only dead shells, but 2 or 3 nice and fresh.

Patulopsis, quite a lot, some with animal.

Pseudohyalina, miscellaneous hundreds.

Polita, something like *rhoadsi*, etc.

Habroconus, plenty—2 species on leaves but one may be another genus.

Euconulus, miscellaneous hundreds.

Guppya, abundant.

Agriolimax was found on the mesa.

Limax was brought me to-day by my doctor from Huachinango.

Philomycus, three or four quite sizable specimens besides young.

Opeas, apparently quite a variety.

Leptinaria, plenty of adult.

Pseudosubulina and *Spiraxis*, scads of them.

Streptostyla s. s. Lots of nice big, fresh shells but only one young one alive. Why?

Streptostyla (*nicolcti* group). One specimen of what I think is a new species.

Streptostyla (s-g.?) Funny-looking shell, plenty of them alive.

Salasiella, not infrequent.

Euglandina, a few specimens of one of the small glassy sections.

Practicolella, quite good set.

Polygyra, infrequent, but must have quite a few.

Trichodiscina with animal, I think 2 species.

Thysanophora, *T. plagioptycha* at least recognized, on ferns about a foot above ground.

Drymaeus, only two species.

Cœlocentrum, two species, I think.

I wrote you that I spotted F. & C.'s type locality of *Lysinoe humboldtiana* and found a nice electric line that goes right close by. Spent an hour at La Vesta in a torrential rainstorm and got a number of specimens of a big *Drymæus*, but did not get out to El Desierto. I hope to be enough recuperated by the higher, drier climate of Mexico City so that I can get in some good work. I am also going to make another try for *Leptarionta guillarmodi* and *Ceres* at Cordoba if I can. I will leave Vera Cruz Sept. 11, which will get me into Philadelphia about the 20th. Hoping to see you in about a month, I remain,

Yours truly,
HORACE B. BAKER.

Care of Mexican Light & Power Co.,
Necaxa, Estado Puebla,
Ee. Un. Mexico."

SOME NOTES AND A LIST OF SHELLS OF RIO, KENTUCKY

BY WILLIAM J. CLENCH

(*Concluded from p. 12*)

The following is a complete list of the species obtained at Rio. Where the year is noted it designates that the species was only taken at that time. Where no yearly citation appears, the species was collected both years. This only applies to the Unionidae and Pleuroceridae, as little or no time was spent in 1925 for land shells.

I am under great obligation to Dr. Walker, Dr. Ortmann and Mr. Calvin Goodrich, who have identified most of the material.

Glenbrook Spring

Lymnaea humilis modicella (Say)
Physa microstoma Hald.
Goniobasis laqueata Say

* * *

About the Spring

Polygyra plicata Say
" tridentata (Say)
" inflecta (Say)
" albolabris (Say)
" zaleta (Binn)
" appressa (Say)
" thyroides (Say)
" stenotrema (Fer.)
Gastrocopta armifera Say
Mesophix laevigata Pfr.
Vitrea indentata Say
" capsella (Gld.)
Gastrodonta ligera (Say)

* * *

Green River, at Toll bridge

Campeloma integrum (Say) ?
Pleurocera undulatum Say
Lithasia obovata Say
Lampsilis anodontoides (Lea) 1924
Proptera alata (Say) 1924

* * *

Green River on the Shoals

Goniobasis curreyana Lea
Quadrula pustulosa Lea
" metanevra wardi (Lea)
Tritogonia verrucosa (Raf.)
Cyclonaias tuberculatus Raf.
Pleurobema cordatum (Raf.) 1925
Pleurobema cordatum coccinea (Conr.) 1925
Pleurobema cordatum catillus (Conr.) 1925
Amblema costata Raf.
Fusconaia subrotunda (Lea)
Fusconaia subrotunda kirtlandiana (Lea)
Fusconaia ebena (Lea) 1924
" flava (Raf.)
Megalonaias gigantea (Barnes) 1925
Elliptio crassidens (Lam)
" dilatatus (Raf.)
Lastena lata (Raf.) 1925
Lasmigona costata (Raf.)
Alasmidonta marginata (Say) 1925
Strophitus rugosus (Swains) 1924
Ptychobranchus fasciolare (Raf.)
Cyprogenia irrorata (Lea) 1925
Obovaria subrotunda (Raf.) 1924
Obovaria subrotunda lens (Lea) 1924
Actinonaias carinata (Barnes)
Ligumia recta latissima (Raf.)
Eurynia vanuxemensis (Lea) 1924

Leptodea fragilis (Raf.)
Proptera alata (Say)
Micromya ortmanni Walker
Lampsilis siliquoidea (Barnes) 1924
Lampsilis ovata (Say) 1925
Lampsilis ovata ventricosa (Barnes)
Truncilla truncata Raf.
Dysnomia triquetra (Raf.) 1925

Bibliography

1895—Cooke, A. H. Camb. Nat. Hist. Mollusca.
1920—Grier, N. M. Nautilus, Vol. XXXIV.
1922—Jewell, M. E. Ecology, Vol. III.

A NEW PECTEN FROM THE LOOCHOO ISLANDS

BY W. H. DALL

Pecten (Chlamys) smegmatus n. sp.

Shell compressed, glistening, whitish above with reddish flecks, darker and more crowded distally; a few opaque white zigzag markings near the umbo; lower valve white with purplish flush near the umbo and reddish margin on the wings; sculpture of the upper valve with nine low subangular whitish rays with one smaller ray in the interspaces with one or two small threads on each side of it; wings nearly smooth, oblique, the left wing much the largest; sculpture of the lower valve of numerous low undulated riblets with one or two small threads in the interspaces; the sculpture grows feeble toward the umbo; byssal notch wide and deep, ctenolium with eleven denticulations; height of shell, 33; width of shell, 30; of hinge-line, 17; diameter, 7 mm.

Loochoo Islands; Coll. Thaanum, No. 9455.

This is nearest some of the forms of *Pecten squamosus* Gmelin, but has a different sculpture with no indication of raised scales. The surface has a greasy sheen. A single specimen was obtained by Messrs. Thaanum and Langford, during their collecting trip of 1925.

NOTES AND NEWS

The Abundance of Crepidula fornicata L. at Nantucket, Mass. In all my collecting I never saw *Crepidula fornicata* in such great numbers as on July 14 along the north shore of Nantucket, from the bathing beach west for over a mile. A northeast wind was blowing and at high-water mark there was a windrow of shells from one to two feet wide. About one half of the shells were alive, attached in numbers to one another or in some cases to pebbles, and here also the shells were attached to one another. To the number of 7 or 8 the two clusters extending from the opposite sides of the pebble, the lower shell of each cluster being so closely fitted to the small pebble that the latter was often scarcely visible. This species was practically the only shell on the beach at the time.—C. W. Johnson.

Euconulus fulvus again. In his article *Zur Nomenklatur einiger Paläarktischer Landschnecken* (Archiv f. Molluskenkunde, 1926, pp. 87–94), Dr. W. A. Lindholm contends for the resurrection of *Helix trochiformis* Montagu in place of *Euconulus fulvus* (Müller). I fully went over this question in Nautilus XXII, 1908, pp. 25, 26. I showed that Gmelin had eliminated *H. bidentata* from Möller's composite species in 1791, and Draparnaud, 1801, accepted this elimination and revised Müller's species, restricting the name *fulvus* to the *Euconulus*. As first reviser of a composite species, he had a perfect right to do this, and according to the International Commission rules, his action cannot be reversed. *Euconulus fulvus* therefore stands.—H. A. Pilsbry.

Mr. William J. Clench has been appointed curator of mollusks at the Museum of Comparative Zoology, Cambridge, Mass. Conchologists everywhere will be glad to hear that this important collection has a special custodian again.

Daudebardiella was mentioned as one of Ferriss' finds on page 4 of Nautilus for July. This was a slip of the pen; *Horatia* was intended.

STROBILOPS AENEA, n. sp., is the form known in some United States collections as *S. labyrinthica strebeli*. It is much more depressed than *S. labyrinthica*, the periphery decidedly angular, ribs finer and more closely set, color dark brown with a golden gleam. The umbilicus is contained about 7 times in the diameter. Basal folds 3 or 4. Height 1.8, diam. 2.7 mm. Type locality, Cazenovia, N. Y. To be fully described and figured in my monograph of New York mollusks.—PILSBRY.

In Bull. American Pal., Vol. I, No. 2, 1895, I described *Strepsidura heilprini*. I find that this name is preoccupied by de Gregorio in his Monographie de la Faune Eocenique de l'Alabama, p. 84, 1890. I therefore rename my species *Strepsidura contorta*.—T. H. ALDRICH.

MR. H. N. LOWE, of Long Beach, on his way home from Cuba, stopped long enough to show us some of his good finds.

OPERCULA IN SHORE DEPOSITS. The abundance of opercula and great rarity of shells in the Pliocene deposit carrying *Scalez petrolia* (noticed in our last two numbers) appears rather anomalous, but a similar occurrence has been noticed in the living fauna, though the conditions controlling such an assortment have not been determined. In the *Journal of Conchology*, XI, 1905, p. 178, I find the following note by Mr. A. L. Massy: "Opercula of *Bithynia tentaculata*. Messrs. Dean and Jackson in their paper on 'A Chara and Shell-Marl Deposit at Haweswater' (antea p. 148) mention that in one or two cases the deposit on the beach consisted entirely of opercula *Bithynia tentaculata*. This reminds me that in July, 1903, I visited Lough Gur, Co. Limerick, and found the shore in one place white with opercula of this species. At various other points along the shore a belt of foamy scum had drifted to the edge of the lough, which, when examined, yielded myriads of opercula together with a few dead shells of the species, and a few empty shells of *Valvata piscinalis* and *Planorbis contortus*."—H. A. P.

TYPES OF SPARTINA AND DISTÆCTRIA Harris and Burrows, AND CYLINDRELLA Pfr. In the Manual of Conchology XVIII,

p. 336, it was implied that the type of *Distæctria* and *Spartina* was *Cylindrella parisiensis* Desh., since that is the only species mentioned under those names. It was stated by the authors, however, that *Distæctria* "Cossmann" is proposed as a substitute for *Cylindrella* Pfr., 1840 (not *Cylindrella* Swainson, Malacology, pp. 135, 326, May, 1840), and *Spartina* as a substitute for *Thaumasia* Albers, so that my conclusion is probably not tenable. *Distaectria* is really an error for the earlier *Distœchia* Crosse, but if considered to be a new name and a substitute for *Cylindrella* Pfr. it will have the same type as the latter, here designated as *Clausilia antiperversa* 'Fer.' Desh. It becomes therefore a synonym of *Brachypodella* Beck. In this connection it may be mentioned that Jousseaume (Mém. Soc. Zool. France, 1889, p. 247) used the combination "*Microstoma hanleyanum* (Pfr.)." This was apparently an error for *Mychostoma* Albers. If considered a new name *Microstoma* will become a synonym of *Brachypodella*. *Thaumasia* Albers, 1850 (not of Perty, 1830), is a synonym of *Urocoptis* Beck, its type being *Cylindrella cylindrus* Chemn., designated by Kobelt, Illustr. Conchylienbuch, p. 271, 1880. This species also becomes the type of the substitute name *Spartina* H. & B. The conclusions reached are thus as follows:

Cylindrella Pfeiffer, 1840, Archiv für Naturg. VI, 38, type *Clausilia antiperversa* 'Fér.' Desh. here designated.

Thaumasia Albers, 1850, Die Hel. 207, type *Cylindrella cylindrus* Chemn., designated by Kobelt, 1880.

Spartina Harris & Burrows, 1891, The Eoc. and Oligoc. Beds of the Paris Basin, 113, type *Cylindrella cylindrus* Chemn.

Distæctria Harris & Burrows, 1891, *t. c.* 114, type *C. antiperversa* 'Fér.' Desh. (not *Distoechia* Crosse).

I am indebted to Dr. H. Burrington Baker for calling my attention to this matter, and for a memorandum of most of the literature.—H. A. Pilsbry.

Mr. Charles Hedley has been engaged during the summer in making a boring in the Great Barrier Reef of Queensland, for the Barrier Reef Committee, the intention being to go down until the underlying continental rock is reached, whether at

500 or 1500 feet. His results are looked for with great interest by all who are concerned with coral-reef problems, geological and biological.

PUBLICATIONS RECEIVED

Venezuelan and Caribbean Turritellas. By Floyd Hodson (Bull. Amer. Pal., vol. 11, no. 45, 50 pp. and 30 pls., June, 1926). This paper is based on more than two years of field work on the stratigraphy and paleontology of certain areas. Over 50 new species and subspecies are described and figured, the illustrations are excellent. Such names as *A-L-Owensi* n. subsp. and *G-A-Weaveri* n. sp. seem very objectionable in that form.—C. W. J.

On South African Marine Mollusca with Description of New Species. By J. R. le B. Tomlin (Ann. Natal Museum, vol. 5, pt. 3, pp. 283–301, pl. 16, 1926). One new genus, *Alexandria*, and eleven new species are described and figured.

Ueber zwei arktische Mollusken aus Gronland, von L. Soós und H. Schlesch (Archiv für Mollusk. LVIII, 178–184, Taf. 6, 1926).

General Index of all Families, Genera, Species and Varieties described and noted in The Journal of Conchology, vols. I–XVI, Proceedings of the Malacological Society of London, vols. I–XV, The Conchologist and The Journal of Malacology, vols. I–XII, 8vo, 165 pp. Compiled by H. McClelland (Published for the Compiler by Birbeck & Sons, Ltd., Birmingham). The multiplicity of notes and single items of information on a multitude of genera and species contained in periodical literature, has made it almost impossible to deal thoroughly with such topics as distribution, variation, bionomics, etc. Unless treated in a separate article, or accompanied by new systematic names, such items together with many important discussions bearing on classification, etc., are generally not noticed in the Zoological Record. Such an Index as that compiled by Mr.

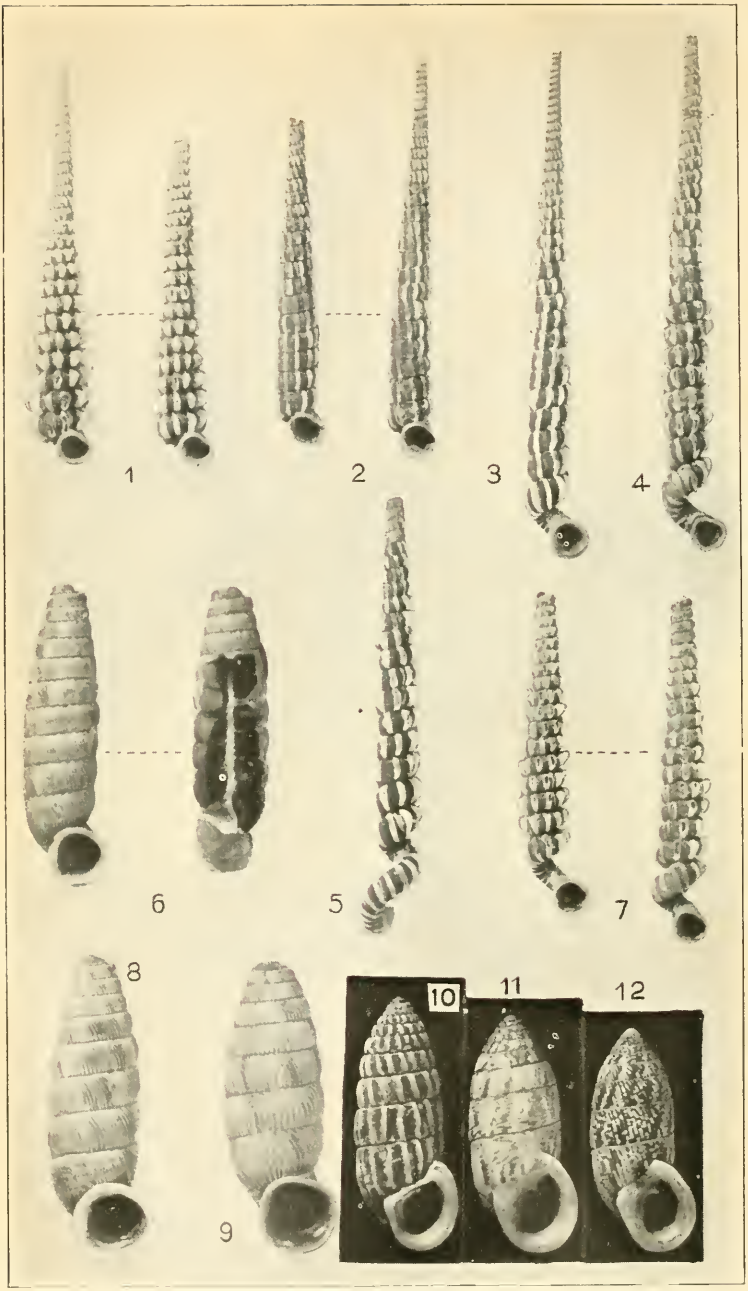
McClelland is therefore a powerful and indeed indispensable aid to all workers on malacology in its various ramifications. The compiler should feel repaid for the exacting labor of preparing it by the gratitude of his fellow workers on mollusca.—H. A. P.

Die Nachtschnecken der palaearktischen Region. By P. Hesse (Abhandl. Archiv f. Molluskenk. II, Heft 2, 1926). This work contains a review of the classification with definitions of families, genera and lower divisions, and a systematic catalogue of the species, with their varieties. We note the following new groups: *Caspilimax*, type *Limax keyserlingi* Marts.; *Mesarion*, type *Arion subfuscus* Drap.; *Carinarion*, type *Arion circumscriptus* Johnst.; and *Microarion*, type *A. intermedius* Norm. The full specific references and synonymy make this a very convenient handbook of the subject.—H. A. P.

Anthracopupa britannica *sp. nov.*, a Land Gastropod from the Keele Beds of Northern Worcestershire. By Leslie Reginald Cox, M. A., F. G. S., Abstr. of Proc. Geol. Soc., London, April 29, 1926, p. 72. This interesting addition to the Carboniferous land-snail fauna is closely related to *A. vermilionensis* Bradley of Illinois.

Further notes on British Lower Tertiary Pupillidæ. By L. R. Cox. Proc. Malac. Soc. Lond. XVII, April, 1926. The British species of *Strobilops* are fully worked out and figured. *Isthmia dubia* Newton and Harris is referred with some doubt to the genus *Acanthopupa* Wenz. As the exterior appears to be "fairly smooth" the relationship to that genus seems to be very uncertain.

Fossils from quarries near Suva, Viti Levu, Fiji Islands, etc. By Wendell C. Mansfield (Pub. No. 344, Carnegie Institution of Washington, 1926, pp. 85–104). 18 species are reported, two *Pecten* and one *Tellina* now; most of the species are only determined generically. "The fauna suggests a Tertiary age, probably late Miocene or early Pliocene."



CUBAN LAND SHELLS
Figs. 1-9, × 2^1_4

The Nautilus.

Vol. XL JANUARY, 1927. No. 3

CUBAN LAND SHELLS OF THE LOWE-HAND-EMERY EXPEDITION PLATE I

BY H. A. PILSBRY

The Cuban land-snail fauna is so prolific in narrowly localized species that real collectors, even in a hasty trip, are likely to pick up novelties. The plate contributed by Mr. H. N. Lowe represents several undescribed forms found by Messrs. Emery, Lowe and Hand in the course of the trip described on pages 37–41, together with some closely allied forms figured for comparison.

Snails of the Urocoptid subgenus *Callonia* have always been considered among the most beautiful of their group. Set with gem like, snow-white, hollow ribs on a golden brown or an almost maroon ground, and of slender, graceful shape, they are the patricians of their family.

In *U. elliotti* (Poey), Pl. I, fig. 1, from the Sierra de Guane, the last whorl is very shortly free in front, and the ribs are very high. Mr. Lowe was so lucky as to find a related but clearly distinct species in one place in the same mountain, which Dr. Torre's keen eye at once recognized as new, calling it U. LOWEI n. sp., Pl. I, fig. 2. It is more slender than *elliotti*, with much lower ribs, the last whorl barely free in front. Length 23.5, diam. above aperture 3 mm., in a specimen retaining all of the 30 whorls (the upper 15 empty, light brown).

In the Sierra de Paso Real, *U. dautzenbergiana* (Crosse), Pl. I, fig. 3, was found. In this charming snail the last third or half of the last whorl descends free from the preceding in the typical form, fig. 3. The specimens taken on this occasion are a variant race in which almost the whole last whorl is free, Pl. I, figs. 4, 5. The most perfect ones are over 30 mm. long. At the caves near Mendoza—all of these places are in Pinar del Rio Province—a smaller race was found, var. *gemmata*. The specimens about 20 mm. long, Pl. I, fig. 7. They have very high, rather triangular ribs, and nearly a whorl is free. These figures represent all of the Callonias known up to this time.

In the same place, Mendoza caves, another new *Urocoptis* turned up, U. HANDI Torre, n. sp., Pl. I, fig. 6. It is cylindric, with the upper third tapering, truncate, of a dull, clouded ashy and flesh color, rather weakly ribbed, the ribs uniting by pairs in a series of low, small bosses at the suture, often with a single rib between the pairs. The expanded whitish peristome is free, the interior brown. On the internal axis there are three lamellæ, the lowest one being widest. This form differs from *U. vignalensis* by the narrower shape, weaker ribs, the regularly denticulate suture and the smaller aperture. It is scarcely distinguishable from *U. cærulans* Poey externally, but differs by the 3-lamellate axis. Length 18.3, diam. above aperture 4.7 mm., nearly 11 whorls remaining.

A form of *U. vignalensis* having finer sculpture than typical was taken at the Mendoza caves, Pl. I, fig. 8. A rather short *U. vignalensis* from Vinales, the type locality, is figured for comparison, fig. 9.

Some interesting Cerions were found, among them *C. johnsoni* Pilsbry & Vanatta, found about half a mile east of Mariel Lighthouse, and *C. salvatori* Torre, Pl. I, fig. 12, which is abundant at Playa de Santa Fé, Punta Brava, in Havana Province. The type of this species, fig. 11, is from Jaimanitas; length 31.5 mm., diam. above aperture 12 mm. This species is very similar to the Cárdenas region *C. sagraianum*, but widely separated geographically. *C. marielinum* Torre, fig. 10, from near Mariel Lighthouse, is a strongly ribbed species, the ribs white on a dull brown ground. It is allied to *C. chrysalis* Fér.

Length 33.3, diam. above aperture 11.5 mm.; on the penult whorl 14 ribs.

Explanation of Plate I follows; figures 1 to 9 are enlarged.

Fig. 1. *Urocoptis elliotti* (Poey). Sierra Guane, coll. by J. B. Henderson. 95033 A. N. S. P.

Fig. 2. *Urocoptis lowei* Torre. Sierra Guane, coll. by H. N. Lowe. 141496.

Fig. 3. *Urocoptis dautzenbergiana* (Crosse). Sierra Paso Real. 73010.

Figs. 4, 5. *Urocoptis dautzenbergiana* (Crosse) var. Sierra Paso Real, coll. by H. N. Lowe. 141497.

Fig. 6. *Urocoptis handi* Torre. Mendoza Caves, coll. by H. N. Lowe.

Fig. 7. *Urocoptis dautzenbergiana*, var. *gemmata.* Mendoza Caves, coll. by H. N. Lowe and E. E. Hand. 141498.

Fig. 8. *Urocoptis vignalensis*, var. Mendoza Caves, coll. by H. N. Lowe. 141495.

Fig. 9. *Urocoptis vignalensis* (Wright & Pfr.). Vinales, coll. by E. E. Hand. 141888.

Fig. 10. *Cerion marielinum* Torre. Mariel Lighthouse, coll. by H. N. Lowe. 141505.

Fig. 11. *Cerion salvatori* Torre, Type. Jaimanitas. 132601.

Fig. 12. *Cerion salvatori* Torre, striate form. Playa de Santa Fé, Habana Prov., coll. by Lowe and Hand. 141507.

MOLLUSK NOTES FROM THE NORTHWEST

BY JUNIUS HENDERSON

Assisted by various friends at various times, I spent the summer of 1925 in collecting mollusks and echinoderms in the Puget Sound Basin, Alaska, at Lake Atlin, in British Columbia, and at Cancross and White Horse, in Yukon Territory. As a result, nine large boxes full of material were shipped by freight to the University of Colorado Museum. Miss Elberta Craig, assistant in the Museum, has worked up most of this

material, with the help of specialists on some of it, and her report will probably appear in an early number of the University Studies. Meanwhile, from the great mass of material a few outstanding items here selected may be of interest to readers of The Nautilus.

An *Anodonta* was found in considerable numbers in several lakes of the Puget Sound region. Having determined that it was not any species definitely known to occur there, Miss Craig sent examples to Dr. Bryant Walker, who identified them as *A. beringiana* Middendorff. Simpson (1914) gives the range of this species as Kamchatka and Alaska. Dall (1905) gives also the lower Yukon region and Mongolia. Hannibal's (1912) synonymy throws grave doubt upon his indefinite records from the Columbia and Fraser River systems, but the Puget Sound material makes at least the Fraser River seem within its range. Absence of definite records from between Puget Sound and Alaska forcibly reminds one that there is a vast area in the Northwest conchologically unknown. Very little has been done with the fresh-water faunas north of the Columbia River, in fact. It is an exceedingly inviting field.

No other Naiades were found during the entire season. *Sphaerium*, *Musculium*, *Pisidium*, *Ferrissia*, *Planorbis*, *Physa*, *Aplexa* and *Lymnaea* of various species were found in Puget Sound Basin, but the two first-named and *Ferrissia* are absent from the collections obtained farther north. *Pisidium*, as usual, was found in almost every pool and lake. *Ferrissia caurinus* (Cooper) we found only on the under sides of pond-lily pads. *Lymnaea stagnalis wasatchensis* Hemphill, described from Utah and hitherto recorded northward to the Mackenzie River drainage, we found in the Yukon drainage at Lake Atlin and White Horse, identified by Dr. F. C. Baker. *Valvata lewisi helicoides* Dall was obtained at the same localities, identified by Dr. Bryant Walker, as was also *Planorbis similaris* Baker, described from Colorado and found by us at Atlin.

On the entire trip we did not succeed in getting into any good localities for land snails. The only especially interesting form found is *Ariolimax columbianus maculatus* Ckll., a beautiful black-spotted variety from Whitby Island, in Puget Sound. The

fauna of small land snails at Skaguay in Alaska, and at White Horse and Atlin, Yukon Territory, so much resembled that of the Southern Rockies that it was difficult to believe that the aspen groves were not in Colorado. The following were obtained: *Gonyodiscus cronkhitei* (Newc.), *Euconulus fulvus alaskensis* (Pils.), *Succinea* sp., *Vitrea binneyana* Morse (?), *Zonitoides arborea* (Say), *Pupilla muscorum* (L.), *Vertigo modesta* Gould and *Agriolimax campestris* Say.

The marine faunas of the Northwest are much better known than the non-marine. We obtained a fine series at various localities between the mouth of the Skagit River and Deception Pass, and at Rosario on the open coast of the Straits of San Juan de Fuca, showing successive changes in the faunas as the water becomes progressively more saline to the westward. At Hikai Island, near the mouth of the river, the river water at low tide forces the salt water back and produces an almost fresh-water condition, with brackish water at high tide. Here but a few species are found—*Mya arenaria* L. (introduced), *Mytilus edulis* L., *Macoma balthica* (L.), *Littorina* and *Acmaea*. Working westward, where the water is less and less affected by the river and more nearly free from fine silt, more and more strictly marine species appear. In Deception Pass and at Rosario, with clear marine water, heavy surf and strong tidal currents, many species of marine gastropods are found, with a few of the smaller pelecypods, starfishes and sea-urchins.

On Big Hope Island, in Puget Sound, between Fidalgo and Whidby Islands, we found a fine Pleistocene deposit of marine shells that does not appear to have been reported. Though the formation is partly thoroughly consolidated, tilted to a high angle and raised many feet above the present high-tide level, the species contained, nearly 30 in number, were nearly all found also living within a few miles of the island, and the others still live somewhere on the Northwest Coast. The most interesting item, perhaps, is the abundance of *Petaloconchus complicatus* Dall and *Mya truncata* (L.), neither of which I found alive anywhere, though a few fresh valves of the latter were found on beaches of Alaska The fossil specimens of *Pecten islandicus pugetensis* Oldroyd (identified by Dall) are all very

much larger than the type, many reaching a length of 77 mm. The fossil *Schizothaerus* is *S. nuttalli maxima* (Middendorf), distinguished by its more rotund form from the one living on near-by beaches, *S. n. capax* (Gould). *Trichotropis cancellatus* (Midd.) var. is, according to Dr. Dall, the same as a variety he has recent from Alaska. Mrs. Oldroyd (1924) gives the range of *cancellatus* as from Bering Sea to Oregon, and she records it from off the San Juan Island coast in from 15 to 25 fathoms of water. The variety is common in the fossil collection from Big Hope.

THE RACES OF HELMINTHOGLYPTA AYRESIANA

BY H. A. PILSBRY

During a recent visit Mr. H. N. Lowe called my attention to the variations of *H. ayresiana* on the various Santa Barbara Channel Islands.

The original locality of *H. ayresiana*, "Nootka Sound," was of course erroneous, but as the specimens from San Miguel Island, the western of the Santa Barbara Channel Islands, agree with the description in form, sculpture and number of whorls, that place may be considered the type locality. These shells are solid, earthy, more or less costulate irregularly, with from fully 6 to nearly 7 closely coiled whorls. The dark band has very indistinct light borders, or these may not be apparent.

Hemphill[1] distinguished the Santa Cruz Island form as a variety; later he applied a name, which appears on some labels but was not published. This form seems to be at least subspecifically distinct.

HELMINTHOGLYPTA AYRESIANA SANCTÆCRUCIS, new subsp.

The shell is somewhat more depressed, thinner and darker colored than *ayresiana*, snuff-brown to clay color, with a carob-brown band with distinct pale borders (in specimens lacking the thin periostracum the color is between light pinkish cinna-

[1] Zoe I, 1890, p. 331.

mon and avellaneous). Wrinkles of the surface are low, not rib-like. In specimens of the same diameter there is about a half whorl less than in typical *ayresiana*. Height 15.4, diam. 23 mm.

Santa Cruz Island. Type 10682 ANSP.

This form occurs also on Anacapa, both living and fossil. According to Dr. Yates[1] it was in peril of extermination on Middle Anacapa in 1889. In most specimens seen the umbilicus is narrower than in Santa Cruz shells, but some have it equally as wide.

I have not seen the form of Santa Rosa Island, but Mr. Lowe informs me that some he has seen agree with the Santa Cruz and Anacapa race.

A NEW SUBSPECIES OF PLANORBIS

BY H. A. PILSBRY

In the monograph of New York Mollusca, which it is hoped will be published during 1927, various new species and subspecies are to be described and figured, among them the following form, which has been recalled to my attention by the receipt last month of a second lot from Chief Justice Latchford. As the first lot received is dated 1896, it appears to have been first collected over 30 years ago. In order to validate the name given several years ago in my MS. and furnished to several correspondents, before it leaks into print elsewhere, a description follows. As the history of *P. bicarinatus* Say, *antrosus* Conrad, is rather involved, the familiar specific name is used here.

Planorbis antrosus latchfordi, n. subsp. Pl. I, fig. 10. The shell is large, resembling *P. a. percarinatus* Wkr. somewhat, but thinner, less solid, yellowish-olivaceous; the surface between carinæ is much less convex, the cavity of the right side larger, of the left side narrower than in *percarinatus*. Lip

[1] The West American Scientist VII, 1890, p. 8.

expanded, thickened within. Surface finely thread-striate. Greatest diam. 19 mm., height 11 mm.

Meach's Lake, Hull, Quebec. 45058 ANSP., collected by Chief Justice F. R. Latchford.

CONCHOLOGICAL NOTES FROM THE HAWAIIAN ISLANDS

BY JUNIUS HENDERSON

With my brother, Frank G. Henderson, of Los Angeles, and his son, I spent five weeks of last July and August in the Hawaiian Islands, mostly on Oahu. Occasionally we were able to get away from the serious business of swimming in the surf of famed Waikiki, for collecting trips to Pearl Harbor, Waimea, Haleiwa and other places along the coast. A few items may be of interest to readers of THE NAUTILUS.

We found that the Chinese, Japanese and Hawaiians eat almost any marine animals, even sea urchins. It is not uncommon to see the women gathering the tiny marine *Neritas* by bucketsful from the rocks at low tide, and they are sometimes sold in the fish markets. We did not notice them getting the *Neritinas* from fresh-water sloughs, though they are abundant locally, larger and seemingly as suitable for food, but *N. granosa* Sowerby was frequently noticed in the markets. Other species of mollusks common in the fish markets at the time of our visits are *Tapes philippinarum*, *Purpura aperta* Blainville, *Thais harpa* (Conrad), *Cellana exarata* Nuttall, *C. argentata* Sowerby, and an occasional large *Cypraea mauritiana* Linn.

Bryan, in his Natural History of Hawaii, mentions *Helcionis-cus* (= *Cellana*) *exaratus* an oblong species of limpet, marked by very strong, regular, sharply-defined, radiating ribs, but does not mention the much larger *H. argentatus*, which is nearly circular, with weaker, less regular sculpture and silvery within. The largest examples of the latter now before me measure 67 x 70, 67 x 72 and 67 x 74 mm., while the largest *exaratus* measure 40 x 53, 37 x 49 and 44 x 56 mm. Bryan's figure labeled *exaratus* is surely *argentatus*. We have both species

also fossil from elevated Quaternary beaches on the islands of Maui, Kauai and Niihau, obtained by Dr. Norman E. A. Hinds, now of the University of California. We also found both species fossil by the railroad bridge near Waimea, Oahu, associated with *Purpura aperta* and *Cypraea tessellata* Swainson.

In the same book Bryan records *Hinnites giganteus* Gray, a California species, from the Hawaiian Islands. I always considered that an error and am now convinced of it. We found no *Hinnites* and learned of none found on the islands, but did find a species of *Spondylus*, in the coral dredgings at Pearl Harbor and Waikiki, that externally very closely resembles *H. giganteus*, though of course the hinge is different. This may explain the Hawaiian record. Dr. W. H. Dall writes me out of his large experience with Hawaiian mollusks and his access to the National Museum, that the *Hinnites* does not occur there.

Conrad, in "Descriptions of New Marine Shells from Upper California," Jour. Acad. Nat. Sci. Philadelphia, Vol. VII, 1847, pp. 227–268, described quite a number of species from other regions, including the Hawaiian Islands, or Sandwich Islands, as they were then commonly called. *Mytilus crebristriatus*, *Perna incisa*, *P. costellata*, *Avicula pallida*, *A. nebulosa*, *Cytherea hieroglyphica*, *Chama iostoma* (Atooi[=Kauai]), *Tellina dispar*, *T. obliquilineata*, *Anatifa carinata* and *engonata* (barnacles), *Purpura bulbiformis* and *P. foliacea* (Atooi[=Kauai]), are all definitely assigned to these islands by him, a pretty good list for a paper purporting in its title to deal only with California shells, but that is not all. Pease long ago declared that *Purpura* (=*Thais?*) *harpa*, attributed by Conrad to Santa Barbara, California, is found only in the Hawaiian Islands. *Perna californica* is also Hawaiian and is so placed by Conrad, notwithstanding the misleading specific name he gives it.

We come now to *Cypricardia* (*Trapezium*) *californica*, which according to Conrad, "inhabits soft argillaceous rocks, which are bare at low water, with the Pholades [*Pholas californica* and *P. penita*], in the vicinity of Sta. Diego and Sta. Barbara." I have never found this species on the Pacific Coast and have not seen it in any collection from America. However, we found several examples of fossil in the deep dredgings from the ancient

coral reef, a quarter of a mile or so back from the present beach at Waikiki, and in the dredgings used as ballast on the railroad between Pearl City and Waipio, in both cases plainly fossil. Dr. Dall writes that he considered this the same species as *Trapezium duperryi* Desh., 1841. Common sense suggests that Conrad's misleading specific name should be discarded in favor of Deshayes' later one, but the rule of priority seems to stand in the way. This also applies to *Perna californica.*

In a brief walk along the railroad tracks east of Waipio we obtained from the ballast 67 species of mollusks, all or nearly all of which are still living along the coast of the island. In the dredgings said to have come from 20 to 30 feet deep in the coral far inland at Waikiki we obtained just 100 species. In the railroad cut east of Waipio, 15 or 20 feet above the present high-tide line, we found a thick deposit composed almost entirely of *Ostrea retusa* "Pease" Sowerby, a species that, so far as we learned, is not now living on the island. This is not kitchen-midden material, but a true fossil deposit *in situ.*

NEW VARIETIES OF STAGNICOLA FROM WISCONSIN AND WYOMING

BY FRANK C. BAKER [1]

During the preparation of the manuscript for the Monograph of the Fresh Water Mollusca of Wisconsin, two forms of Stagnicola have been observed which appear to need recognition as varieties. These are described below.

STAGNICOLA EMARGINATA VILASENSIS nov. var.

Shell large, elongate-ovate to almost globular in form, inflated, thin to rather thick; periostracum brownish to whitish horn color; surface dull, sculpture of coarse growth lines and well-developed spiral lines; heavy spiral ridges are present on

[1] Contribution from Museum of Natural History, University of Illinois, No. 41.

the body whorl of some specimens; whorls 5½, convex, more or less tumid, the body whorl usually more or less flattened, almost straight in some individuals, with a pronounced shoulder; spire elongated or very much flattened, varying from as long as the aperture to one-fifth its length; sutures deeply impressed; aperture large, expanded, often patulous, long-ovate to roundly-ovate, from one-half to four-fifths the length of the shell, rounded below, somewhat angular above, yellowish-brown or purplish within; peristome sharp, thin; inner lip very wide, broadly reflexed over the umbilical region, leaving a rather widely open umbilical chink; there is a wide columellar callus spreading well over this region which is frequently raised from the body whorl, causing the aperture to become entire; not infrequently the inner lip is strongly curved to the left, producing a pseudo-canal; there is a marked columellar plait.

L. 35.0; W. 28.0; Ap. L. 27.0; W. 16.5 mm. Type. U. of Ill., Z21678.

L. 33.0; W. 27.0; Ap. L. 25.0; W. 15.3 mm. Paratype. U. of Ill., Z21679.

L. 38.0; W. 25.5; Ap. L. 25.0; W. 15.2 mm. Paratype. U. of Ill., Za1679.

L. 32.5; W. 20.0; Ap. L. 20.0; W. 12.0 mm. Paratype. U. of Ill., Z21679.

L. 29.0; W. 22.0; Ap. L. 19.5; W. 12.0 mm. Paratype. U. of Ill., Z21679.

Type locality: Big Muskallonge Lake, Vilas Co., Wis. Types: Museum Natural History, U. Ill., No. Z21678, Z21679; Acad. Nat. Sci. Phila., No. 141864.

Remarks: This fine shell, though at first sight apparently quite a distinct species, is doubtless an extreme variation of *Stagnicola emarginata*. Its nearest relative appears to be *mighelsi* Binney, from which it differs in its more angular body whorl which forms a distinct shoulder, its broader, flatter spire and usually deeper sutures, and its wider and rounder aperture, which is more patulous. The flattening of the body whorl in the majority of specimens examined is peculiar. There are long-spired examples which recall typical *emarginata*, small specimens recalling *angulata*, and some rounded specimens re-

calling *wisconsinensis*. It may be a variation produced by isolation, as Big Muskallonge Lake is without an outlet at the present time. Typical *emarginata* occurs in Plum Lake, about five miles east of Big Muskallonge Lake, but these are normal, resembling the Maine specimens. The new variety also occurs in Pelican Lake, Crow Wing Co., Minnesota, indicating a wide range. These were collected many years ago by Dr. W. A. Nason and are now in his collection in the University museum (No. Z21681). The new variety appears to be the maximum variation in the *emarginata* group, rivaled only by some extreme examples of *mighelsi*.

STAGNICOLA PALUSTRIS WYOMINGENSIS nov. var.

Shell differing from typical *palustris* in being more scalariform, having a more obese body whorl, a longer aud more acute spire, which is sharply pyramidal, and with more tightly coiled whorls, the spire being longer than the aperture, which is rounder, not elongate-ovate. There is usually a distinct umbilical chink, which is absent or but feebly developed in typical *palustris*.

L. 19.5; W. 9.0; Ap. L. 9.0; W. 4.5 mm. Type. U. of Ill., Z21682.

L. 19.5; W. 9.0; Ap. L. 9.0; W. 4.2 mm. Paratype. U. of Ill., Z21683.

L. 19.0; W. 9.5; Ap. L. 8.8; W. 4.5 mm. Paratype. U. of Ill., Z21683.

L. 18.5; W, 7.3; Ap. L. 7.5; W. 3.8 mm. Paratype. U. of Ill., Z21683.

Type locality: Slough 10 miles south of Lander, Wyoming. Types: University Museum, Z21682, Z21683; Acad. Nat. Sci. Phila., 141866; University Colorado Museum.

Remarks: This variety of the wide-spread *palustris* appears to differ sufficiently from the type for recognition. Its acute spire, short, rounded aperture and well rounded whorls will distinguish it. It has been identified as *proxima* Lea, but that species, while having a long, pointed spire, has flat-sided whorls and shallower sutures. The type of Lea's species has been examined for comparison, and it is quite different. The radulae

of the two forms (*proxima* and *palustris*) should be examined as these may show differences not indicated in the shells.

The new variety will probably be found widely distributed in the mountain region of Wyoming, Utah, Montana and Colorado. Apparently the same form has been submitted for identification by Dr. J. C. Needham, of Cornell University, who collected the specimens near Wellsville, Utah.

NEW VARIETIES OF HELISOMA ANTROSA FROM WISCONSIN AND MINNESOTA[1]

BY FRANK C. BAKER

HELISOMA ANTROSA CAHNI var. nov.

Differing from *antrosa portagensis* F. C. Baker in being very much larger, the aperture relatively wider, not ear-shaped, the upper part not being as acutely elevated above the upper angle of the whorl, the dorsal and ventral carinae of the whorls not acutely cord-like, and the height averaging greater (8–10 per cent.) than in *portagensis*. The shell is thinner than in the latter variety. Spiral sculpture marked.

H. 12.5; D. 18.0; Ap. H. 12.0; D. 7.0 mm. Type.
H. 12.0; D. 18.5; Ap. H. 11.5; D. 6.5 mm. Paratype.
H. 11.0; D. 15.0; Ap. H. 10.5; D. 6.0 mm. Paratype.

TYPE LOCALITY: Big Muskallonge Lake, Vilas Co., Wis. TYPES: Univ. Ill., No. Z21124; Paratypes, Acad. Nat. Sci. Phila., No. 141567.

This variety was at first thought to be a variation of *portagensis*, described from Portage Lake, Maine (NAUT. XXII, p. 45; XXIII, p. 8, pl. I, fig. 9), but its normally larger size, differently shaped aperture, and greater relative height seem to mark it as another variety of this wide-spread species. Occasional immature specimens have the upper part of the whorl acutely raised above the dorsal angle of the whorl, but no fully

[1] Contribution from Museum of Natural History, University of Illinois, No. 36.

adult specimen has been seen of this form. It is named in honor of Dr. Alvin R. Cahn, of the Department of Zoology, Univ. of Illinois, who collected the material. It is interesting to note that *Stagnicola emarginata wisconsinensis* F. C. Baker was also found in this lake.

Helisoma antrosa shellensis F. C. Baker, nov. var.

Shell differing from *antrosa* in being higher axially, with a deeper and more conical basal depression and a deeper and more flatly concave spire region; the body whorl bordering these areas is more sharply angled; aperture longer in comparison with width, with a bluntly formed v-shaped angle above and below; sculpture of distinct spiral lines; color always deep brownish; body whorl rounded, not flattened.

L. 9.0; D. 13.0; Ap. L. 8.0; D. 4.5 mm. Type.
L. 9.0; D. 12.0; Ap. L. 8.3; D. 5.0 mm. Paratype.
L. 8.0; D. 12.–; Ap. L. 7.5; D. 4.0 mm. Paratype.

Type Locality: Shell Lake, Washburn Co., Wis. Types: Univ. Wis. Mus., No. 4627; Paratypes, Univ. Ill., No. Z19354; Phila. Acad. Nat. Sci., No. 141566.

This small form of *antrosa* cannot be placed in any of the described varieties; it resembles *portagensis* in the ear-shaped aperture, but the whorls are rounded, not flat-sided, and the dorsal carina is near the center of the whorl while in *portagensis* it is near the outer edge of the whorl; the same characteristics separate from *cahni*, besides its much smaller size. It somewhat resembles an unnamed lake form which is abundant in the waters of Wisconsin and Michigan, differing in its greater height and centrally-placed dorsal carina. *Shellensis* occurs in a rather deep lake (said to be 40 feet deep) in the St. Croix drainage. Many of these lakes are of artificial origin, but it could not be ascertained whether this was one of these or not. The variety was fairly abundant, and was personally collected.

Helisoma antrosa minnesotensis nov. var.

Shell differing from all other varieties of *antrosa* in having a perfectly flat or even *convex* spire, the nuclear and second whorls

slightly sunken below the general level of the spire; dorsal carina rather sharply defined, placed near the outer edge of the body whorl, which is flatly rounded; umbilicus small, narrow, deep, the base of the whorl distinctly angulated; aperture about as wide as high, spiral sculpture fine but distinct.

L. 7.0; D. 11.2; Ap. L. 5.5; D. 5.0 mm. Type.
L. 6.0; D. 10.0; Ap. L. 5.5; D. 5.0 mm. Paratype.
L. 5.7; D. 8.5; Ap. L. 5.0; D. 3.8 mm. Paratype.

TYPE LOCALITY: Frontenac, Minn. TYPES: Coll. F. C. Baker.

Three shells, the diagnosis of which is given above, have been in the writer's possession for twenty-five years. Their description has been delayed in the hope that additional material might be found. None has been offered, and it seems desirable to publish the form that others may be on the watch for it. The chief characteristic is the very flat spire, so unusual in *antrosa*, and the very small, narrow umbilicus. The specimens were given to the writer many years ago by Sister Kostka, a Catholic nun of Frontenac, who made quite a collection of Minnesota mollusks.

Helisoma antrosa is a notable example of acceleration in evolution, due to a lake environment. The typical form is a river or creek species and varies very little in the south—Alabama, Oklahoma, Arkansas, etc. Even in Illinois the form is uniform and very abundant in the streams in the southern part of state. In the glacial lakes of the northern part of the United States, especially in Michigan, Wisconsin and Minnesota, each lake, or series of lakes, appear to have its own particular form. Some of these lakes are without present outlet, Big Muskallonge Lake being of this character. What the many lakes in southern Canada and in the unexplored waters of Minnesota contain can only be surmised.

Figures of the varieties, as well as of the radula of *cahni*, will be published in the writer's Monograph of the Fresh Water Mollusca of Wisconsin.

A LIST OF LAND SHELLS COLLECTED IN CUBA IN JULY, 1926

BY E. E. HAND

The following list of 102 species and varieties were collected by Messrs. D. L. Emery, H. N. Lowe and myself, during our Cuban trip described in the October NAUTILUS. The following is a list of the localities visited:

Abra de Figueroa	Yumuri Valley
Near Bellamar Caves	Matanzas
Camoa	Sierra de Paso Real
Sierra de Guane	Pinar del Rio
Guyabal	Playa Marianao
Havana	El Tumbadero
Mariel	Vinales

The genera and species are arranged alphabetically for easy reference.

Alcadia dissimulans Poey. Sierra de Guane.
hispida Pfr. Matanzas.
minima Orb. Guyabal.
nitida Pfr. Matanzas.
velutina Poey. Sierra de Guane.
Annularia blaini Gund. (= *semicanus*, Morelet.). Vinales.
illustris Poey. Matanzas.
Cepolis bonplandi Lam. Havana, Matanzas and Pinar del Rio Prov.
bonplandi var. Prov. Havana, Matanzas, Pinar del Rio.
cubensis Pfr. Matanzas.
cubensis var. camoensis. Camoa.
multistriata Desh. Guyabal.
parallela Poey. Sierra de Guane, Sierra de Paso Real.
parriana Orb. El Tumbadero, Vinales.
subtussulcata Pfr. El Tumbadero, Vinales.
Cerion infandum Shutl. Matanzas.
marielinum Torre. Mariel Lighthouse.
chrysalis Fér. Playa Marianao.
mumia fastigiatum Mayn. Havana.

mumia Brug. E. Side Matanzas Bay.
mumiola Pfr. E. Side Matanzas Bay.
mumiola var. Matanzas.
johnsoni Pils. & Van. Mile E. of Mariel Lighthouse.
salvatori Torre. 1 mile E. of Mariel Lighthouse.
Chondropoma auberianum Orb. Guyabal, Matanzas.
affine Torre. El Tumbadero, Vinales.
dentatum Say. Matanzas.
egregium Gund. El Tumbadero, Vinales.
gundlachi Arrango. Sierra de Paso Real.
irradians Shutt. Abra de Figueroa, Matanzas.
obesum Menke. E. Side Matanzas Bay.
ottonis Pfr. Guyabal.
pfeifferianum Poey. Guyabal, Camoa.
pictum Pfr. Matanzas.
pictum minor. Matanzas.
poeyanum Orb. Guyabal, Camoa, Mariel.
poeyanum gouldianum. Abra de Figueroa.
sagebieni Poey. Sierra de Guane, Caves near Mendoza.
shuttleworthi Pfr. Sierra de Guane.
shuttleworthi scopulorum Torre. El Tumbadero, Vinales.
vinalense (Wright) Pfr. Vinales.
yucayum Presas. Near Bellamar Caves, Matanzas.
Ctenopoma bilabiatum Orb. Sierra de Guane and Sierra de Paso Real.
Eutrochatella conica Pfr. = (*elegans* Orb.). Guyabal, Matanzas.
chrysochasma Poey. Caves near Mendoza.
jugulata Poey. Sierra de Guane.
nodae Arrango. Vinales.
regina lyrata Torre. Vinales.
remota Poey. Vinales.
rupestris Pfr. Matanzas.
sloani Orb. Camoa.
Eutudora camoensis Torre. Loma de Camoa.
limbifera Menke. Near Bellamar Caves, Matanzas.
Helicina adspersa Pfr. Guyabal, Camoa, Vinales, Matanzas.
adspersa onusta Fér. El Tumbadero, Vinales.

sagriana Orb. Sierra de Guane, Sierra de Paso Real, El Tumbadero, Vinales.
submarginata Gray. Yumuri Valley, Matanzas.
Laevoleacina oleacea Fér. Matanzas.
solidula Pfr. Matanzas.
subulata Pfr. Matanzas.
Liguus crenatus Swains. Matanzas to Guane.
fasciatus Müll. Havana, Matanzas.
fasciatus hepaticus Bolt. El Tumbadero, Vinales.
fasciatus murreus Rve. Matanzas to Guane.
Megalomastoma apertum Poey. Camoa, Guyabal.
mani decurrens Poey. Sierra de Guane.
Microceramus perconicus Pils. *anafensis* Hend. Guyabal.
Opeas gracile Hutt. Playa Marianao.
Pleurodonte auricoma Fér. Havana Province.
auricoma major. Havana Province.
auricoma minor. Havana Province.
guanensis Poey. Sierra de Guane, Sierra de Paso Real, El Tumbadero, Vinales.
marginella Fér. *arangiana* Poey (Introduced). San Francisco.
marginella transitoria Pfr. (Introduced). Guanabacoa.
Polygyra paludosa Pfr. Everywhere.
Praticolella griseola Pfr. Playa Marianao.
Proserpina depressa Orb. Everywhere.
Rhytidopoma nodulatum Poey. Guyabal, Sierra de Anafe.
rugulosum Pfr. Abra de Figueroa.
Subulina octona Brug. Playa Marianao.
Thysanophora boothiana Pfr. Guyabal.
stigmatica Pfr. Havana and Pinar del Rio Provinces.
Torrella immersum Gund. Matanzas.
Urocoptis cærulans Poey. Sierra de Guane.
cyclostoma ischna Pils. Camoa.
dautzenbergiana Crosse. Sierra de Paso Real.
discors Poey. Sierra de Guane.
elegans Pfr. Near Bellamar Caves.
elegans auberiana Orb. Playa Marianao, Abra de Figueroa.
humboldtiana Pfr. Camoa.

irrorata Gund. Vinales.
nodulifera Torre. Vinales.
nubila Poey. Sierra de Paso Real.
poeyana Orb. Guyabal.
poeyana variegata Pfr. Matanzas.
propinqua Gundl. Vinales (First Mogote).
rugeli Shutt. Abra de Figueroa, Matanzas.
scalarina Shutt. Abra de Figueroa, Matanzas.
strangulata Poey. Guines.
vignalensis (Wright) Pfr. Vinales.
vignalensis obscura Torre. Vinales.
Varicella acuticostata Orb. Guyabal.
gracillima Pfr. Matanzas.
pritchardi Arango. Caves near Mendoza.

NOTES ON THE NAIADES OF LONG ISLAND: II. ANODONTA CATARACTA ON LONG ISLAND

BY N. M. GRIER
Des Moines University

Anodonta cataracta Say has been previously reported on Long Island from Kissena Park Lake, Flushing, (1), Lake Ronkonkema, (2), and from Prospect Park, Brooklyn, (3). The closely related if not identical species, *Anodonta implicata* Say, is also known from Prospect Park and from Baisley's Lake, Jamaica, (1, 3). In August, 1926, I observed an abundance of dead shells of *Anodonta cataracta* in the Nissequoque river at Smithtown, L. I., and at the Hempstead reservoir near Hempstead. This species does not seem to have been reported previously from either of these localities. Additionally, *Elliptio complanatus* Dillwyn is described as being moderately abundant at Riverhead, L. I. (4). All these species are members of the depauperate Atlantic coast fauna, having been reported from New England by Johnson, (5), while they are also found further south. Earlier, (2) I suggested the fair probability of their introduction on Long Island through the agency of birds,

and of course most likely from localities on the Atlantic coastal plain. It was also pointed out that the characteristic thinness and softness of the shells of these species indicated a natural adaptation of them to the practically lime-free waters of Long Island. It is possible also that other species are transported similarly, but survive only in a given area under favorable conditions.

A glance at the map of Long Island will show that a number of the localities mentioned are in a line such as aquatic birds might follow in flying from one body of water to another. Such a line connects Riverhead at the east end of the island with Lake Ronkonkema, Nissequoque River, Hempstead reservoir, Jamaica and Prospect Park, Brooklyn. Since birds are the most conceivable agency explaining the presence of fresh water mussels on Long Island, it may well be that such a path of migratory birds, passing northeast or southwest through the island, may account for the distribution of *Anodonta cataracta* which has been indicated.

I was lead to seek further support for these conjectures from the available records of the local movements of birds. Unfortunately, the United States Bureau of Biological Survey had no data for the region, while the most comprehensive and available publication on the birds of the vicinity (The Birds of the New York City Region, 6) mentioned but three species of aquatic birds which had been observed at any of the localities at which mussels had been collected. These were the Hooded Merganser (*Lophodytos cucullatus*), observed at Hempstead and Prospect Park, and recorded also from New Jersey; the Little Black Rail (*Creciscus jamaicensis*), known only from Long Island in the region and at Jamaica; and possibly the water thrush (*Seiurus noveboracensis noveboracensis*), from Prospect Park, Brooklyn.

The cooperative attitude of the Bureau of Biological Survey toward problems of this type is brought out in their letter of August 21st to the writer:

"Your suggestion—that bird banding coöperators maintain a watch for young mussels that might be attached to the feet or other parts of birds, is of much interest. We appreciate the information that might be obtained in this manner and will be

glad to see that the matter is brought to their attention through the medium of Bird Banding Notes."

It is urged that readers of this note endeavor to enlist interest in this matter on the part of bird banders operating in their region.

Literature Cited

1. Nautilus, 16, 1902.
2. Amer. Mid. Nat., 8, 1923.
3. Brooklyn Conch. Club Bull., 1, 1907.
4. Annals Lyceum Nat. Hist., N. Y., 1870.
5. Fauna of New England, Part 13, List of Mollusca, Bost. Soc. Nat. Hist., 1915.
6. Amer. Mus. Nat. Hist., Handbook Series, No. 9.

HELIX NEMORALIS IN MASSACHUSETTS

BY CHARLES W. JOHNSON

When a species is deliberately introduced and becomes established, the interest attached to it is slight in comparison with an introduction that has been accidental and which when discovered has assumed the proportions of a large and flourishing colony.

Through the kindness of Mr. Albert P. Morse, I received an interesting series of *Helix nemoralis* Linn., collected by Miss Marion F. Lewis at Marion, Mass., October 10, 1926. Miss Lewis found them in one place along a stone wall beneath some nasturtium plants. She was unable to ascertain when they were first observed, or the extent of their distribution. The collection of 31 specimens comprises 18 of the yellow form var. *libellula* and 13 of the dark reddish-pink form var. *rubella*, which show the following banding:

Var. *libellula*

1. 12345.
1. 123(45).
3. 00345.
6. 00300.
7. 00000.

Var. *rubella*

1. 12345.	1. 00000.
11. 10300.	

To attain this amount of variation would indicate that this colony of *H. nemoralis* has been there for some time. We trust that another season's investigation will throw some possible light on the time and manner of introduction, and also their present distribution and abundance.

A closely related species *Helix hortensis* Müll. is an old-timer along our immediate sea coast (see THE NAUTILUS, Vol. 20, pp. 73–80, 1906). *H. nemoralis* was introduced by W. G. Binney at Burlington, N. J., in 1857. They increased with great rapidity and are still to be found there. A colony was discovered at Lexington, Va., in 1886 (see THE NAUTILUS, Vol. 3, pp. 51 and 73, 1889). These are still abundant and exhibit great variation in banding. In THE NAUTILUS, Vol. 31, p. 107, 1918, Mr. Manly D. Barber records a colony of *H. nemoralis* at Knoxville, Tenn. These had been introduced about eight years before, having been brought from Lexington, Va., by Mrs. Chas. C. Ross. On September 2, 1925, Dr. A. E. Ortmann discovered a flourishing colony at Lynchburg, Va. (NAUTILUS, Vol. 39, p. 73, 1926). These had also probably been transplanted from Lexington, Va.

CHARLES HEDLEY

The sudden death of Mr. Charles Hedley which occurred at his residence, "Nukulailai," Mosman (Sydney), on September 14th, has removed from our midst one of Australia's most eminent scientists and one who was deservedly popular among a large circle of friends both here and abroad.

He was born in England in 1862, and spent much of his youth in the south of France and in Switzerland. He came to Australia as a young man and was for some time on the land in Queensland. But natural history always had a strong attraction for him, and in 1889 he entered the service of the Queensland Museum, Brisbane, and later, as naturalist, accom-

panied Sir William Macgregor on an expedition to British New Guinea. In 1891 he removed to Sydney and became attached to the Australian Museum, where in 1896 he became Conchologist and in 1908 Assistant Curator. In 1920, on the death of R. Etheridge, Junior, he became Acting Curator and subsequently Principal Keeper of Collections. He resigned in 1925 to become Scientific Director of the Great Barrier Reef Investigation Committee and was still in the service of the committee at the time of his death.

Mr. Hedley was recognized as one of the world's leading conchologists, and there were few branches of zoology of which he did not have an extensive knowledge. He was an accomplished botanist and ethnographer, and had made a profound study of zoogeography, in which he was an acknowledged leader.

Mr. Hedley was an intrepid and seasoned explorer; he had traveled widely and had made many extended trips to Torres Strait, New Guinea, and various Pacific islands, and few men had a more intimate knowledge of the Pacific and its inhabitants.

In 1896 he accompanied the Royal Society of London's expedition to bore the Funafuti Atoll and made important contributions on the ethnology and natural history of the island to the Memoir issued by the Trustees of the Australian Museum.

He was a Fellow of the Linnean and Malacological Societies of London, an Honorary Member of the New Zealand Institute, and of the Royal Societies of Victoria, Queensland, South Australia and Western Australia, and a Corresponding Member of the Academy of Natural Sciences of Philadelphia. He was a past President of the Royal, the Linnean and Royal Zoological Societies of New South Wales. In 1916 he gained the David Syme Prize for Scientific Research and in 1925 the Royal Society of New South Wales awarded him the Clarke Memorial Medal, the highest honor in its gift.

He was completely absorbed in his work and was always ready to make sacrifices in the interest of scientific advancement. He was a most generous donor to the Australian Museum both in specimens and works of reference, and many of his collecting trips, which invariably yielded a rich harvest of results, were financed by himself.

Mr. Hedley was invariably courteous and kindly, and his charming personality and accomplishment as an expositor and conversationalist had endeared him to a large number of friends. He was always helpful to younger workers, many of whom acknowledge their indebtedness to his encouraging assistance and advice. He was exceedingly energetic and took great pleasure in long treks on foot through the bush and by the seashore and those who were privileged to accompany him on his walks derived great enjoyment from his entertaining and informative conversation.

Only recently Mr. Hedley returned to Sydney from Queensland and was happily making preparations for a trip to Japan as one of the Australian representatives to the Pan-Pacific Science Congress. He contracted a cold and more serious symptoms followed, but no one anticipated that his death would occur so soon.

By the staff of the Australian Museum, many of whom had been associated with Mr. Hedley for a long period and had experienced many kindnesses at his hands, his death is keenly felt, and the utmost sympathy is extended to Mrs. Hedley and his adopted daughter.—*The Australian Museum Magazine*, Oct.-Dec., 1926.

DATES OF PUBLICATION OF THE PARTS OF THE MANUAL OF CONCHOLOGY, FIRST SERIES (CEPHALOPODA, MARINE GASTROPODA, POLYPLACOPHORA, SCAPHOPODA)

COMPILED BY E. G. VANATTA

The data concerning the first ten volumes are from Mr. Tryon's subscription book, in which the date of issue of each part is given. Dates of sending out of the subsequent volumes are from the books in which the sendings to subscribers were recorded.

Dates of publication of the parts of Vols. I to IX, Second Series, were published in the *Index to the Helices*, 1895, p. 116. In the table there given two mistakes were made:

Vol. II, Part 8, date should be Nov. 24, 1886.
Vol. III, Part 9, date should be Feb. 7, 1887.

Vol. I.	Part	1,	pages 1– 64.	Dec. 30, 1878.
		2,	65–128.	Mar. 29, 1879.
		3,	129–192.	June 28, 1879.
		4,	193–316.	Oct. 6, 1879.
Vol. II.	Part	5,	pages 1– 64.	Jan. 2, 1880.
		6,	65–128.	Mar. 31, 1880.
		7,	129–192.	July 6, 1880.
		8,	193–289.	Oct. 25, 1880.
Vol. III.	Part	9,	pages 1– 64.	Dec. 31, 1880.
		10,	65–128.	Mar. 28, 1881.
		11,	129–192.	June 6, 1881.
		12,	193–310.	Oct. 3, 1881.
Vol. IV.	Part	13,	pages 1– 64.	Jan. 3, 1882.
		14,	65–128.	Mar. 29, 1882.
		15,	129–192.	July 3, 1882.
		16,	193–276.	Oct. 3, 1882.
Vol. V.	Part	17,	pages 1– 64.	Dec. 21, 1882.
		18,	65–128.	Mar. 26, 1883.
		19,	129–192.	July 18, 1883.
		20,	193–276.	Oct. 18, 1883.
Vol. VI.	Part	21,	pages 1– 64.	Dec. 27, 1883.
		22,	65–150.	April 18, 1884.
		23,	151–214.	June 10, 1884.
		24,	215–413.	Oct. 2, 1884.
Vol. VII.	Part	25,	pages 1– 64.	Jan. 12, 1885.
		26,	65–152.	April 20, 1885.
		27,	153–240.	July 3, 1885.
		28,	241–309.	Oct. 12, 1885.
Vol. VIII.	Part	29,	pages 1– 64.	Jan. 23, 1886.
		30,	65–128.	May 3, 1886.
		31,	129–192.	July 28, 1886.
		32, 32*a*	193–461.	Nov. 24, 1886.

Vol. IX.	Part 33, pages	1– 64.	Feb. 7, 1887.
	34,	65–128.	June 8, 1887.
	35,	129–224.	Sept. 2, 1887.
	36, 36*a*	225–488.	Dec. 10, 1887.
Vol. X.	Part 37, pages	1– 64.	Mar. 16, 1888.
	38,	65–144.	July 1, 1888.
	39,	145–208.	Oct. 1, 1888.
	40,	209–323.	Jan. 3, 1889.
Vol. XI.	Part 41, pages	1– 64.	April 17, 1889.
	42,	65–128.	July 5, 1889.
	43,	129–208.	Sept. 30, 1889.
	44, 44*a*	209–519.	Mar. 7, 1890.
Vol. XII.	Part 45, pages	1– 64.	May 27, 1890.
	46,	65–128.	Aug. 12, 1890.
	47,	129–192.	Dec. 16, 1890.
	48,	193–323.	May 1, 1891.
Vol. XIII.	Part 49, pages	1– 64.	Aug. 3, 1891.
	50,	65–112.	Nov. 3, 1891.
	51,	113–160.	Jan. 30, 1892.
	52,	161–195.	April 25, 1892.
Vol. XIV.	Part 53, pages	1– 64.	July 25, 1892.
	54,	65–128.	Nov. 25, 1892.
	55,	129–208.	Feb. 25, 1893.
	56,	209–350.	July 1, 1893.
	53*a*,	i–xxxiv.	July 1, 1893.
Vol. XV.	Part 57, pages	1– 64.	Nov. 16, 1893.
	58,	65–132.	Mar. 19, 1894.
	59,	133–180.	July 27, 1894.
	60,	181–436.	Feb. 2, 1895.

NOTE.—In the numbering of the plates of this volume, the numbers 51 to 58 were omitted. The work is complete without these.

Vol. XVI.	Part 61, pages	1– 48.	Aug. 20, 1895.
	62,	49–112.	Nov. 26, 1895.
	63,	113–160.	Mar. 13, 1896.
	64,	161–262.	Sept. 23, 1896.
	64*a*,	i–vii.	Sept. 23, 1896.

Vol. XVII. Part 65, pages 1– 80. May 11, 1897.
66, 81–144. Oct. 15, 1897.
67, 145–224. May 3, 1898.
68, 225–348, i–xxxii. Dec. 7, 1898.

AN INDEX TO THE NAUTILUS

Since THE NAUTILUS contains a large part of the literature of mollusks of the United States produced in the last thirty-odd years, as well as much relating to other countries, the need of a general index has often been expressed. Some years ago the compilation of such an index was undertaken by Mr. John B. Henderson, and after his death it was completed by Dr. Wm. H. Dall. Drs. Bryant Walker and Geo. H. Clapp have made its publication possible, and it is now nearly through the press. The price has been fixed at $5.00 for the volume of over 400 pages.

We need hardly say that this Index will be invaluable to all who possess THE NAUTILUS and to workers in Mollusca in all countries.

NOTES AND NEWS

PROFESSOR ADDISON EMERY VERRILL, for forty-two years professor of zoology at Yale University, until he was made emeritus professor in 1907, has died, aged eighty-seven years. He was spending the winter at Santa Barbara, California. Professor Verrill is well known to conchologists for his extensive and valuable publications on the mollusks of our northern Atlantic waters and Bermuda, but he was equally an authority on several other Classes of invertebrates such as the corals, crustacea, echinoderms. More extended notice will follow.

OCCURRENCE OF OPERCULA IN SHORE DEPOSITS.—I have been reading a note of yours in the current number of THE NAUTILUS

and thought you might be interested in another case of opercula in deposits.

A friend was working on some peat deposits in Sussex (South coast) containing remains of *Bos primigenius* and other late Pleistocene remains, and I enquired of him *re* shells. He referred me to the results of their work in the Brighton Museum, and I found that there were no molluscan remains whatever except very many *opercula* of *Bithynia tentaculata.* No shells found. My view was that the acids in percolating water dissolved the shells, but the opercula being mostly chitin survived. Whereas in calcareous marls the abundance of $CaCO_3$ saved the shells from being dissolved, the acid being fully used before attacking them. As to your reference to the Chara deposit at Hawes Water, I know it well, and have worked it often with Dean. I think the opercula patches are the result of drifting caused by wavelets on the lake washing the lighter opercula away from the heavier shells which are equally abundant. I hope this may be of interest.—C. E. Y. Kendall, The University, Liverpool.

Correspondence from Florida.—In a letter received from Mr. Norman W. Lermond, from Gulfport, Fla., Nov. 1, he says: "Have been out on four collecting trips since arriving here a week ago yesterday and have made quite a haul. Mitchell's Beach, on one of the keys which we reached in a row boat was literally covered with shells, sponges, coral, etc. Saturday when in St. Petersburg I collected about 50 lbs. of fossil shells that were dredged from the bay and used for filling back of the new Vinoy hotel. Friday I waded along the shores of Boca Ceiga Bay to Cat Point, opposite Bird Key (U. S. Government Bird Reservation), and filled a sack with good sized *Busycon perversum*, a few extra large *Melongena corona* and one very large *Fasciolaria tulipa.* I am hunting far and near for a 24-inch *F. gigantea*, dead or alive. I was lucky in finding on one beach a perfect specimen of *Raeta lineata* with the animal still alive."

A New Name for Acmæa apicina Dall.—As it seems there is an *Acmæa apicina* of Gray, 1857 (as *Patella*), my species of that name which dates only from 1879, may take the substitute name of *A. aleutica*.—W. H. Dall.

Malanoides tuberculata moussoni, new name.—The following change in Mousson's subspecies is suggested, as Lea's *plicifera* has ten years' priority: *Melanoides tuberculata moussoni*, new name for *Melania tuberculata plicifera* Mousson, Die Land und Süsswasser-Mollusken von Java, p. 73, pl. xi, fig. 7, 1849, not *Melania plicifera* Lea, Trans. Am. Phil. Soc., pl. xxiii, fig. 90, 1839, p. 93.—W. J. Clench.

A large form of Oreohelix yavapai in the Grand Canyon.—Last summer on the Bright Angel trail, in the Grand Canyon of Arizona, I noticed about halfway up that the bright red earth contained shells of *Oreohelix*, to all appearances fossil, and presumably of pleistocene age. Nearly all those exposed were broken, and in the short time at my disposal I only obtained one perfect adult; but any one could doubtless collect a series, given longer time. The shells have in general the characters of *O. y. extremitatis* P. & F. but are much larger, max. diam. 21 mm., the periphery sharply keeled up to about 14 mm. diameter. Impressed groove above suture distinct; penultimate whorl with fine close revolving striae above periphery; brown bands above and below periphery (faintly indicated in the present condition of the shells); umbilicus widely open, diameter about 5.5 mm.; diameter of aperture about 9 mm. The larger size is possibly correlated with a moister climate in past times, and the form may be regarded as a race or subspecies *fortis*, closely related to the much smaller *O. yavapai angelica* P. & F. which occurs living higher up on the Bright Angel trail. Specimens of *angelica* and *extremitatis* from the Grand Canyon have been compared. Type and an immature specimen are No. 141875 ANSP.—T. D. A. Cockerell.

Purpura lapillus and imbricata.—Alphonse Labbé (CR. Soc. Biol., xciii, 1925, pp. 156–158) concludes from a study of

the development that all of the young shells have the characters of *imbricata*. Those growing up in quiet water or under stones retain the features of *imbricata*, but in rough water they develop into *lapillus;* the characters of the latter are not hereditary or racial but directly due to external mechanical and chemical conditions. The studies of Dr. H. S. Colton on the color and sculpture of Maine specimens (Proc. A. N. S. Phila., 1916; Oecology, 1922) led him to conclude that neither of these qualities is induced by the direct action of environment.

A LOST ACHATINA: *A. rucifex* (Capello & Ivens).—In the account of their African travels by H. Capello and R. Ivens, "From Benguello to the Territory of Yacca" (translated by Alfred Elwes; London, 1882) these explorers figure very roughly under the name *Bulimus rucifex* (Vol. I, page 290; mentioned on p. 284) a "gigantic * * * gastropode mollusc" found "scattered about" at the village of Muntimbo, about halfway between the Cuango and the Lu-ali rivers, in the back country of Angola (somewhere about 10° 40′ S., 18° 40′ E. of their map). In the absence of any description the species cannot be recognized by the crude figure until collected again at the original locality, but it is an *Achatina*, and apparently one of the plain species such as *A. bandeirana*, without zigzag stripes.—H. A. PILSBRY.

IS THE AMERICAN SLIPPER-LIMPET (*Crepidula fornicata*) AN OYSTER PEST?—The shortage of oysters (*O. edulis*) on the European oyster beds has led to the introduction in many places of American oysters, on which the American slipper-limpet (*Crepidula fornicata*) frequently occurs. Oyster cultivators in various parts of Europe are therefore becoming interested in the possible effects of introducing the slipper-limpet on their beds, so that it has become a matter of economic interest to know the results to date of the introduction of this animal on English oyster-beds since its arrival about 1880 (see Orton, Proc. Roy. Soc. B. 91, 1909).

The American slipper-limpet (*Crepidula fornicata*) is un-

doubtedly regarded as a great pest on the oyster beds in the Thames Estuary at the present time for the following reasons:

(1) It has spread so rapidly and thrived so well in that locality that it is possible to dredge 20 tons a day on some grounds, actually occupied by oysters. In a pit adjacent to—but not actually a part of—the oyster beds the writer took in July, 1923, in a few minutes haul of the dredge 2226 limpets weighing approximately 26 lbs. On all grounds it has increased the labor in dredging, while adding only slightly or not at all to the income of the oyster-producer.

(2) The limpets attach themselves in piles or chains on the oysters, which have therefore to be cleaned of limpets as well as barnacles, etc., before sending them away from the beds.

(3) It is impossible to remove Crepidula entirely from beds, once it is established on the ground, as it has a free swimming larva—like the oyster—and in addition changes its sex from male to female so that every individual may breed as a female (*loc. cit*). Moreover, spawning occurs in England from about March to November, and females may spawn more than once in a season.

In favor of Crepidula, it may be said:

(1) That it is not an enemy of the oyster but a competitor for space and food, like sea-squirts, various bivalves, and other plankton-feeding animals.

(2) That where Crepidula occurs in abundance it can be dredged in the normal routine of work, and the shells easily accumulated in great piles and cleaned and bleached to serve as cultch for catching oyster spat. On some beds Crepidula is beginning in this way to pay some of its debts to the oyster producer. There can be no doubt, however, that unless Crepidula can be utilized as food—in a small way its shell is utilized in England when crushed with oyster shells as chicken food—it is a great nuisance to the oyster-cultivator.

No serious attempt has been made in England to use the slipper-limpet as food, but it is probable that if Crepidula occurred in quantity in France it would be so utilized, and acclaimed as an undoubted benefit.—J. H. Orton, Marine Biological Laboratory, Plymouth, January 20 (From Nature Magazine, Feb. 27, 1926).

PUBLICATIONS RECEIVED

Land Shells of the Revillagigedo and Tres Marias Islands, Mexico. By W. H. Dall (Proc. Calif. Acad. Sciences, Vol. XV (4 ser.), pp. 467–491, pls. 35–36, 1926). The total number of species recorded from these interesting islands is 35, of which 15 are described as new. The material was obtained by the California Academy's expedition in 1925.—C. W. J.

A New Margarites from Greenland. By W. H. Dall (Proc. Biol. Soc. Washington, Vol. 39, p. 59, 1926). The new species *M. grosvenori* was dredged in 30 fathoms at Etah.

New Shells from Japan and the Loochoo Islands. By W. H. Dall (Proc. Biol. Soc. Wash., Vol. 39, pp. 63–66, 1926). One new subgenus of Planaxis, *Angiola*, and eight new species are described.—C. W. J.

An Anatomic Study of Zonitoides arboreus Say. By Paul Bartsch and Mary E. Quick (Jour. Agri. Research, Vol. 32, pp. 783–791, pls. 1–4, 1926). The exhaustive study of this species was made in connection with an investigation of the sugar-cane-root disease in Louisiana. As this mollusk plays an important part in the spread of the root disease, its positive identification was necessary. The studies prove that those from the District of Columbia and Louisiana are the same notwithstanding their diversity of habits.—C. W. J.

A New Slug from Guadeloupe. By H. B. Baker (Occas. Paper Mus. Zool., Univ. Mich., No. 173, pp. 1–6, pl. 1, 1926). The species described and figured is *Vaginulus* (*Angustipes*) *antillarum*.

Naiades of the Green River drainage in Kentucky. By Arnold E. Ortmann. Ann. Carnegie Mus. XVII, 1926.

The limitation of the Ohio and Cumberland faunas is the chief topic of this interesting paper. Among the 66 forms,

there are no Cumberlandian types. Of the three which have been so regarded, Ortmann now considers that the specimens from the Kentucky and Green rivers formerly called *Alasmidonta minor* are really *A. calceolus*, a well known Ohio drainage form. *Micromya nebulosa* (Conr.), which had been considered Cumberlandian, is to be united with the northern *M. iris* (Lea). *Dysnomia torulosa gubernaculum* (Rve.) is a derivative of the Ohioan *D. torulosa*, and thus of northern lineage, though it occurs in the upper Tennessee as well as in Green River.—H. A. P.

Notes on South African Ancylidae. By Bryant Walker. Occas. Pap. Mus. Zool. Univ. Michigan, No. 175. *Gundlachia burnupi*, *Burnupia obtusata* new species; teeth of *G. burnupi* and *B. caffra* (Krss.) are figured, the drawings by H. Burrington Baker.

The Land Mollusks of the Republic of Panama and the Canal Zone. By H. A. Pilsbry (Proc. Acad. Nat. Sci. Phila., 78 : 57–126. *2 pl., 40 text fig.* 1926). An important paper enumerating all of the known species and subspecies (77) of this region. Specific localities are listed where specimens of the various species have been found, as well as distributional notes and known range limits. Thirty-four species listed are known only from the Republic of Panama; of the remaining, twenty-four species are known northward, thirteen species both north and south, and six species only southward. Thus, the faunal affinities are pronouncedly Central American. Ten genera and subgenera and sixteen species and subspecies are described as new. A new classification of the Sagdidae is given, involving the recognition of several genera in place of *Thysanophora*, most of the West Indian species being removed from that genus.—W. J. Clench.

A New Pecten from Columbia. By W. H. Dall. Proc. Biol. Soc. Wash. 39 : 61–62. 1926.

New Land and Fresh-water Mollusks from Central and South America. By Wm. B. Marshall. Proc. U. S. N. Mus., Vol. 69, 1926. New forms of *Odontostomus*, *Succinea*, *Ampullaria*, *Hyria* and other naiades from Brazil, Colombia, etc. *Nephronaias lempensis*, Salvador, and *Elliptio divaricatus*, Guatemala.

Costa Rican Land Shells Collected by A. A. Olsson. By H. A. Pilsbry. Proc. Acad. Nat. Sci., Phil. 78: 127–133. *1 pl., 4 fig.* 1926. A list of the species collected by A. A. Olsson along the Atlantic Coastal strip of Costa Rica from elevations not exceeding 100 feet. The genera *Occultator* and *Rotadiscus*, a subgenus and five species and subspecies are described as new.— W. J. Clench.

Environmental Influences Which Favour the Development and Spread of the Bilharzia Parasite in South Africa. Food Supply of "*Physopsis.*" By F. G. Cawston. Jour. Trop. Med. Hyg. 1926. The common rush, *Cyperus immensus*, is known to be the favorite food of *Isidora africana* (Krs.) popularly known as "*Physopsis.*" This Planorboid will also feed upon garden truck which is placed in pools and rivers over night to keep them fresh for market. Inasmuch as this mollusk is the intermediate host of the schistosomes, such contamination is a large factor in the spread of the disease.— W. J. Clench.

Vertigo substriata Jeffreys, Faunae neerlandicae nova species—een zoogenaamd glaciaalrelikt. Door Dr. A. L. J. Sunier. Rijks Mus. Nat. Hist., Leiden. This species was first found in the Netherlands in 1925 at a place called Meer en Bosch, south of the Hague. It is regarded as a post-glacial immigrant, perhaps of quite recent date. Its characters and distribution are fully discussed.

Anatomy of Lanx, a limpet-like Lymnæid Mollusk. By H. Burrington Baker (Proc. Cal. Acad. Sci. XIV, No. 8). The

common opening of lung and hindgut is posterior, the lung being vestigeal. "On the basis of much of the anatomy, Lanx could scarcely be separated from the Lymnæidæ, but the peculiar modification of the pallial complex appears to be sufficient grounds for the retention of the Lancidæ as a distinct family."

Synonymy of the British Non-Marine Mollusca (Recent and Post-Tertiary). By A. S. Kennard, A. L. S., and B. B. Woodward, F. L. S. Published by the British Museum. xxiv + 447 pages. Besides giving the synonymy of the genera and species, this work serves as an index to the many British monographs and some of the older foreign ones, so far as included species are concerned, and to the distribution of the species. It exhibits also the results of studies in nomenclature which have engaged the authors during several years. In some cases, such as *Petasina*, *Helicella*, *Xerophila*, their results have been challenged. In the matter of emendation of names, the original orthography has usually been followed, as in *Assiminea*, *Bithynia;* but in some cases emended forms are used, such as *Limnæa*, *Goniodiscus*, *Dreissensia*, Tiaridæ.

The investigations of the present authors and of many others have carried knowledge of British non-marine mollusks far beyond any of the handbooks of the subject, as may be seen in the systematic index of this work. Thus, *Pisidium* has 18 species, one only fossil; *Sphærium*, 7 species; *Valvata*, 7 species; *Vertigo*, 9 species.

The thousands of references to genera and species contained in this work testify to the industry of the authors. The work is of permanent value to all dealing with the historical side of the subject.—H. A. P.

British Snails: A Guide to the Non-Marine Gastropoda of Great Britain and Ireland: Pliocene to Recent. By Arthur Erskine Ellis (Oxford University Press, American Branch, New York; price $3.50). The author is to be congratulated on the production of a popular manual without sacrifice of scientific exactitude. The book begins with an intro-

ductory chapter, which includes parts on the anatomy of *Helix aspersa*, classification, origin of non-marine Mollusca and notes on collecting. This is followed by a systematic list of the Pliocene to Recent forms, a synoptic key of the genera, and the detailed descriptions of the species. The plates, which include practically all of the species, are mainly photographs; on the whole, they are exceptionally clear, although the figures of a few species, such as *Ancylus lacustris* and *Pseudancylus fluviatilis*, are rather unsatisfactory. Two synoptic keys, one systematic and the other purely artificial, would perhaps have been better than the attempted combination of both features. The notes on habits and distribution are especially interesting. Most of the nomenclature is very carefully worked out, so that such incongruities as the emended spellings of *Lymnaea* and *Aplexa* are somewhat surprising. The authority for the statement that *Amnicola taylori* (p. 81) is a North American species should have been given.—H. B. B.

On some South African Gulellæ, with descriptions of new species and varieties. By Henry Clipden Burnup (Ann. Natal Mus. V, May, 1926). A continuation of the much needed revision begun in the first paper of this series; like all of Burnup's work it is convincing and well illustrated.

New Urocoptid land shells from Mexico. By Paul Bartsch (Proc. U. S. N. M. Vol. 70, pp. 1–13, pl. I). Sixteen species, collected by C. R. Orcutt, are described and figured.

American Tertiary Mollusks of the genus Clementia. By W. P. Woodring (U. S. Geol. Surv. Profess. Paper No. 147–C). The history of this group of Veneridæ is traced from the Eocene to Recent time. It was well represented in the tropical American Tertiary, but now found chiefly from Australia to Japan. The American species are described and illustrated.

ARNOLD E. ORTMANN

About 1900

The Nautilus.

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ARNOLD EDWARD ORTMANN

American science has suffered a serious loss in the death at Pittsburgh of Dr. Arnold E. Ortmann, January 3 of this year, in the sixty-fourth year of his age.

"He was born in Magdeburg, Prussia, April 8, 1863. He studied at the universities of Kiel, Strassburg and Jena, receiving the degree of doctor of philosophy in the latter institution in 1885. During 1883 he served for one year in the German Army Reserve and retired with the rank of lieutenant of infantry. He was a favorite pupil of Ernst Haeckel, of Jena, and was with him as an assistant on the expedition which Haeckel made to Zanzibar. He subsequently served for a time as instructor in the University of Strassburg. He came to the United States in 1894 and served as curator of invertebrate paleontology in Princeton University from that date until 1903 when he became curator of invertebrate zoology in the Carnegie Museum, Pittsburgh. He became a naturalized citizen of the United States while living at Princeton. From 1909 to 1910 while retaining his position in the Carnegie Museum he served as instructor in zoogeography, and from 1910 until 1925 as professor of physical geography, and from 1925 until his death as professor of zoology in the University of Pittsburgh.

"While at Princeton in 1899 he was a member of the Princeton (Peary Relief) Expedition. He was a member of the

American Philosophical Society, of the German Zoologische Gesellschaft, of the Leopoldinisch-Carolinische Akademie der Naturforscher, of the American Society of Naturalists and of the Ecological Society of America. He was a fellow of the American Association for the Advancement of Science, and held membership in many other learned societies. He was the author of numerous monographs and papers upon botany and aquatic invertebrates. He contributed to Bronn's 'Klassen und Ordnungen des Tierreiches,' writing the portion of that great work which relates to the Decapoda. His report upon the Tertiary Invertebrates of the Princeton Expedition to Patagonia was published in 1902." [1]

In Ortmann's work on zoogeography he left aside the birds and mammals which had served for the greater part of previous works, and devoted himself to the evidence of aquatic invertebrates. An intimate and exact knowledge of several great groups, and logical marshaling of the facts characterize his papers on this subject, the chief of which are: "Grundzüge der marinen Tiergeographie," Jena, 1896; "The Geographical Distribution of fresh-water Decapods, and its bearing on ancient Geography," 1902, and "The Alleghenian Divide, and its influence upon the freshwater Fauna," 1913, both published in Philadelphia. Not less important is the zoogeographic discussion in his work on the crayfishes. Zoogeographic problems are considered also in many of his faunistic papers.

Some of Ortmann's early work (1890) had been on Cephalopoda. In the last twenty years he returned to the Mollusca, taking up the study of fresh-water mussels with the greatest ardor. His investigations extended from the Ohio system to all the rivers of the eastern United States from New England to the Carolinas and a partial exploration of the rivers of Georgia, Alabama and Mississippi. His researches have thrown a great deal of light upon the geology and transformations of the rivers of the eastern half of the United States. In the morphology and classification of Unionidæ he was soon recognized as the chief American authority. He continued and greatly extended

[1] Quoted from W. J. Holland in Science, Jan. 14, 1927.

the system, which he took up where Simpson's great work left it; and he has set a high standard for future workers on this subject. The "Monograph of the Naiades of Pennsylvania," 1919, and "South American Naiades," 1921, both copiously illustrated, published as Memoirs of the Carnegie Museum, may be mentioned, but every year he produced important papers on different aspects of the subject. One of his great services was the work on unionid gill-structure.

Dr. Ortmann was a man of rather over medium height, strong and well proportioned, cordial and prepossessing in manner. His enthusiasm for natural history was contagious, and contributed largely to his success as a teacher. He possessed the ability in an unusual degree of concentrating all of his powers on the subject in hand. In the field he was indefatigable, never sparing himself, deterred by neither exposure or fatigue in the quest of specimens for his researches. In 1911 the University of Pittsburgh recognized his attainments in science by conferring the degree of Sc. D.

In 1894 he married Anna Zaiss at Achern in Baden, who survives him, with one son and two married daughters. His death is a personal loss to a wide circle of scientific friends and correspondents.—H. A. P.

ADDISON EMERY VERRILL

In the death of Professor A. E. Verrill, the science of malacology has lost one of its prominent contributors. Professor Verrill was born in Greenwood, Maine, February 9, 1839, and graduated from Harvard in 1862, being one of a group of prominent naturalists in the famous Penikese class of Professor Louis Agassiz. He was professor of Zoology at Yale from 1864 to 1907, and assistant in the U. S. Fish Commission from 1871 to 1887. He was the author of many papers on the mollusks of the Atlantic coast. The "Report on the Invertebrate Animals of Vineyard Sound and Adjacent Waters," 1873, was a valuable work, revising the obsolete classification of the mollusks of

Gould's Invertebrata of Massachusetts. Other excellent papers appearing in the Reports of the Fish Commission are "Results of the Explorations made by the steamer *Albatross*" in 1883, and Report on the Cephalopods of Northeastern Coast of America, 1882. The paper "Catalogue of Marine Mollusca added to the Fauna of New England," appeared in the Trans. Conn. Acad., Vols. 5 and 6, 1882–85, and a study of the Family Pectinidae in 1887. The Cephalopods of the "Blake" (Bull. Mus. Comp. Zool., Vols. 8 and 11) appeared in 1881 and 1883. Numerous papers were also published in the American Journal of Science. His great work on the Bermuda Islands (Trans. Conn. Acad., Vols. XI and XII, 1902–1907) contains much of interest pertaining to the Mollusca, as well as to other branches of the zoology, the geology and history of the island.—C. W. J.

LAND AND FRESH-WATER SHELLS FROM NEWFOUNDLAND

BY E. G. VANATTA

The following is a list of the species of shells collected by Bayard Long in Newfoundland during July, August and September of 1925 and 1926. The smaller forms were picked from debris scraped from rock crevices and the surface of the ground in thickets and damp spots. The specimens referred to in THE NAUTILUS, Vol. 38, 1925, p. 93 as *Vertigo hoppii?* prove to be *Vertigo modesta*. All the specimens are in the collection of the Academy of Natural Sciences of Philadelphia.

Helix hortensis Müll. Doctor Hill and Bard Harbor Hill, Highland of St. John, St. John's Bay, Straits of Belle Isle; French Island = Tweed Island, and Lark Island, Bay of Islands, Newfoundland.

Pupilla muscorum L. Doctor Hill; Anse aux Sauvages near Cape Onion; Ha Ha Cape, Ha Ha Bay; Cape Norman.

Vertigo modesta Say. Anse aux Sauvages, Sacred Island off Cape Onion, Brig Bay, Ha Ha Cape, Yankee Point, Savage Point, Back of Savage Cove, Sandy Cove = Poverty Cove, Bard Harbor Hill, Doctor Hill.

Vertigo modesta Say. approaching form *castanea* St. Brandy Island = Schooner Island, Pistolet Bay; Cape Norman; Flower Cove.

Vertigo modesta Say. var. *parietalis* Anc. Anse aux Sauvages, Sacred Island, Ha Ha Cape.

Vertigo ventricosa Mrse. var. *elatior* St. Schooner Island.

Vertigo coloradensis Ckll. var. *basidens* P. & V. Ha Ha Cape, Bard Harbor Hill.

Columella edentula Drap. Anse aux Sauvages, Sacred Island, Schooner Island, Cape Norman, Savage Point, Yankee Point, Ha Ha Cape, Doctor Hill.

Zoogenetes harpa Say. Ship Cove, Sacred Bay; Anse aux Sauvages; Deer Pond Brook, Bard Harbor.

Cochlicopa lubrica Müll. Schooner Island; Ha Ha Cape; Tweed Island; Eddies Cove Brook, Eddies Cove; Back of Savage Cove; Bard Harbor Hill; Doctor Hill.

Polita hammonis Ström. Anse aux Sauvages, Schooner Island, Cape Norman, Tweed Island, Ha Ha Cape, Bard Harbor Hill, Doctor Hill.

Euconulus fulvus Drap. Anse aux Sauvages, Schooner Island, Cape Norman, Savage Cove, Ha Ha Cape, Bard Harbor Hill, Doctor Hill.

Zonitoides arborea Say. Burnt Cape, Pistolet Bay; Bard Harbor Hill, Doctor Hill.

Vitrina limpida Gld. Anse aux Sauvages, Sacred Island, Cape Norman, Ship Cove, Ha Ha Cape, Flower Cove, Bard Harbor Hill, Doctor Hill.

Agriolimax agrestis Müll. Rard Harbor Hill, Doctor Hill.

Agriolimax campestris Binn. Mauve Bay near Cape Baud, Lark Harbor, Back of Savage Cove, Ha Ha Cape, Yankee Point, Flower Cove, Doctor Hill.

Arion hortensis Fér. Lark Harbor.

Gonyodiscus cronkhitei Newc. Anse aux Sauvages, Yankee Point.

Gonyodiscus cronkhitei Newc. var. *anthonyi* Pils. Cape Norman, Ha Ha Cape, Back of Savage Cove, Bard Harbor Hill, Doctor Hill.

Punctum pygmaeum Drap. Bard Harbor Hill.

Succinea ovalis Say. Lark Harbor, Savage Cove, Flower Cove, Eddie's Cove, St. John's Island, Bard Harbor Hill, Doctor Hill.

Succinea avara Say. Sandy Cove, Cape Norman, Yankee Point, Four Mile Cove, Big Brook, St. John's Island, Flower Cove, Back of Savage Cove, Savage Point.

Succinea verrilli Bld. Anchor Cove, Flower Cove, Bard Harbor Hill, St. John's Island.

Lymnæa palustris Müll. Cook Point, Pistolet Bay; Schooner Island; Sandy Cove; Flower Cove; Otter Pond near Plum Point; Brig Bay; Eddie's Cove; Boat Harbor; Big Brooks; Savage Point; St. John's Island.

Physa gyrina Say. Otter Pond near Plum Point, Brig Bay.

Planorbis parvus Say. Otter Pond near Plum Point, East Brook at St. Barbe Bay, Eddies Cove Brook.

Valvata lewisii Curr. Eddies Cove Brook.

Sphaerium occidentale Prime. Otter Pond near Plum Point.

Anodonta marginata Say. Otter Pond near Plum Point.

DESCRIPTIONS OF NEW FORMS OF PLEISTOCENE LAND MOLLUSKS FROM ILLINOIS WITH REMARKS ON OTHER SPECIES

BY FRANK COLLINS BAKER[1]

The study of a large amount of material from loess deposits of Illinois, collected by members of the State Geological Survey of Illinois, has revealed some forms which appear to need recognition either as species or varieties. The modern study of paleontology has drawn rather more closely the limits of specific and varietal differentiation than has been thought desirable previously, but the recognition of the faunas of minor horizons has necessitated such procedure for the purpose of identifying the strata by the presence of characteristic variations which are

[1] Contribution from the Museum of Natural History, University of Illinois, No. 42.

constant, though of minor extent in comparison with variations as found in many recent species. Such minor variations have been noted among loess fossils from Illinois and adjacent states, and it is important from the standpoint of the discrimination of interglacial intervals and their variations in time, that these apparently trivial modifications should be recognized. My thanks are due Dr. M. M. Leighton, Chief, Illinois Geological Survey, for the opportunity of studying the collections made by the Survey.

POLYGYRA HIRSUTA YARMOUTHENSIS nov. var.

Shell differing from recent *hirsuta* in being uniformly smaller, with a straighter parietal lamina which is shorter than in the typical form, the denticle on the peristome is smaller, the base of the shell not usually as convex, and the basal callus is not as heavy.

H. 4.2; D. 6.6 mm. Type.

H. 4.1; D. 6.5 mm. Paratype.

H. 4.5; D. 6.8 mm. Shawneetown Hill loess.

Type locality: Clark Co., Ill., 3 miles southwest of Marshall, in loessal silt. Types: Museum Natural History, Univ. Ill., P2085; Acad. Nat. Sci. Phila., 142707.

Distribution: *Yarmouthensis* occurs in the loess deposits of Illinois, western Indiana (New Harmony and Mt. Vernon) and eastern Iowa. Material is not at hand to determine its exact distribution in Iowa. Stratigraphically it is known from Yarmouth to early Wisconsin time.

Remarks: This form of *hirsuta* is uniformly different from the large shell so abundant in Illinois and Indiana at the present time. Its smaller size (less than 7 mm. diameter) will always distinguish it from the recent form (8–8.5 mm. diameter), besides which the aperture armature is weaker and the base less convex. Specimens from Shawneetown (late Wisconsin) are larger than material from earlier interglacial deposits, indicating a variation toward the recent form. It differs from *pilula* Pilsbry in the form of the basal notch and in its more depressed spire. A small form found in Pennsylvania and other eastern localities is quite similar in form and may be

more closely related than the large form now living in the same region. It differs from *yarmouthensis* in its stronger lip armature and generally more convex base, more globular form and narrower aperture. The eastern form should probably be distinguished as a geographic race.

Polygyra monodon peoriensis nov. var.

Shell differing from typical *monodon* in being smaller, with a smaller umbilical opening, a less elevated parietal lamina which is usually joined to the basal lip near the columella by a more or less well-developed callus.

H. 3.9; D. 6.1 mm. Type.
H. 4.1; D. 6.0 mm. Paratype.
H. 3.5; D. 5.6 mm. Paratype.
H. 5.0; D. 7.0 mm. Adams Co., Curtis Creek.

Type locality: Adams Co., Ill., Municipal quarry near Quincy, Peorian loess. Types: Museum Natural History, Univ. Ill., P1910a; Acad. Nat. Sci. Phila., 142708.

Distribution: This variety has been seen from Yarmouth to Peorian time. It occurs in Bureau, Adams, and Clark Co., Ill., and at Mt. Vernon, Indiana. The latter is believed to represent Sangamon time.

Remarks: This variety of *monodon* is uniformly smaller than most recent forms and has a smaller umbilicus and less well-developed denticles in the aperture. Most recent specimens have a maximum diameter of 8 to 9.3 mm. Specimens from Mercer Co., Ill., range from 7.5 to 8 mm., while the smallest specimens seen are from Arlington, Indiana, and measure 7 mm. in diameter. These small forms differ from the fossil variety in having a larger umbilical opening and a more massive and higher parietal lamina. Loess specimens from Mt. Vernon, Ind., measure 4.3 by 7 mm., and have a higher spire than the Arlington specimens. There is some variation in size among the loess material, but all have the small umbilical opening and weaker parietal lamina.

CIRCINARIA CONCAVA (Say).

A few specimens from the loess of Mt. Vernon, Posey Co., Ind., are smaller and have a more ovate, less rounded aperture than recent forms from Illinois and Indiana, but not enough material is at hand to determine whether this is a geologic race or individual variation. There is great probability that it may be a geologic variation, as in the other forms discussed.

ANGUISPIRA ALTERNATA (Say).

Specimens from Sangamon and Peorian strata average smaller than material from later intervals and the recent fauna, the former having a maximum diameter of 17–17 mm. while the latter run 20–25 mm. The earlier forms are also slightly higher in the spire. More material is needed from loess deposits.

GONYODISCUS SHIMEKII (Pilsbry).

An examination of a large collection of this small species conclusively proves that it is not the same as *cockerelli* Pilsbry, having one more whorl (*shimekii* 5½, *cockerelli* 4½), a larger size (*shimekii* 7 mm, *cockerelli* 6.1 mm. diam.), and coarser striae. Comparisons have been made with *cockerelli* from Colorado, Arizona and New Mexico, mostly identified by Pilsbry. *Cockerelli* is to be considered the descendant of *shimekii* and by students of recent mollusks may be classed as a variety of *shimekii*, but for geological purposes it had best be considered a distinct species. It is apparently a horizon marker, having been found in Illinois only in strata of Peorian age. In Iowa, however, Shimek has recorded it from Yarmouth deposits in Harrison, Monona and Pottawattamie counties (see Baker, Life of Pleistocene, p. 256). In the light of the studies of Alden and Leighton, however, on the Iowan loess (An. Rep. Geol. Surv. Iowa, XXVI, pp. 49–212, 1917) these and other Iowan deposits may be found to be of Peorian age.

SUCCINEA OVALIS PLEISTOCENICA NOV. VAR.

Shells differing from typical *ovalis* in having a rounder aperture and comparatively longer spire; it averages somewhat smaller than the *ovalis* now living in Illinois.

L. 19.0; D. 11.5; Ap. L. 11.5; D. 8.0 mm. Type.
L. 17.2; D. 10.0; Ap. L. 10.–; D. 5.5 mm. Paratype.
L. 16.0; D. 9.0; Ap. L. 9.0; D. 6.0 mm. Paratype.
L. 15.0; D. 9.3; Ap. L. 9.4; D. 6.5 mm. Paratype.
L. 11.5; D. 7.0; Ap. L. 7.8; D. 4.9 mm. Paratype.

Type locality: Clark Co., 3 miles southwest of Marshall, in loessal silt of Yarmouth age. Types: Museum of Natural History, Univ. Ill., P2088a; Acad. Nat. Sci. Phila. 142710.

Distribution: Clark Co. (Yarmouth); Near Alton, Madison Co. (Sangamon); Near Alton, Madison Co., Mercer, Warren, Rock Island, Bureau, Peoria, Union Co. (Peorian). Also in Peorian loess at Freeport, Iowa. Probably the Iowan records of *ovalis* refer to this form.

Remarks: This variation of *Succinea ovalis* is abundant in the loess deposits of Illinois and Iowa and differs sufficiently and constantly enough for recognition as a variety of the recent form. It was apparently characteristic of the dry conditions under which the loesses were deposited. Immature specimens have been identified as *Succinea grosvenori*, from which they differ in the wider aperture and shorter spire. Some forms somewhat resemble *Succinea ovalis chittenangoensis* Pilsbry, from New York State, but the fossil form has a shorter spire and more rounded aperture than that variety (see Pilsbry, Proc. Phila. Acad., 1908, p. 50). *Pleistocenica* has not been observed from strata later than Peorian. The shorter, wider aperture is its chief characteristic, specimens of the fossil and of the recent form of the same size having the following comparative measurements:

Pleistocenica, L. 19; H. 11.5; Ap. L. 11.5; D. 8.0 mm.
Recent *ovalis*, L. 18.5; D. 11.1; Ap. L. 13.2; D. 8.0 mm.

Succinea grosvenorii gelida nov. var.

Shell small, elongated, rather narrow; whorls $3\frac{1}{2}$, convex, separated by deep sutures, last whorl comparatively small, flat-sided, or but slightly convex; spire long, acute; aperture rounded, about half as long as shell; columella straight curving into the parietal wall in a gentle curve, not forming a distinct

angle; there is a slight callus which is spread over the parietal wall; sculpture of rather fine, vertical striae.

L. 8.0; D. 4.2; Ap. L. 4.0; D. 2.4 mm. Type.
L. 7.3; D. 4.0; Ap. L. 3.5; D. 2.3 mm. Paratype.
L. 6.8; D. 4.5; Ap. L. 3.7; D. 2.2 mm. Paratype.
L. 6.6; D. 3.3; Ap. L. 3.1; D. 2.0 mm. Paratype.
L. 7.4; D. 4.1; Ap. L. 3.7 mm. Paratype.

Type locality: Boone Co., one-half mile northwest of depot at Irene, in Peorian loess. Types: Museum Nat. Hist. Univ. Ill., P875a; Acad. Nat. Sci. Phila., 142712.

Distribution: Bureau Co. (Yarmouth); Boone Co. (Sangamon); Mercer, Warren, Whiteside, Bureau, Boone, Rock Island, Adams, Carroll, Ogle, Stephenson, Madison (Peorian); Bureau, Tazewell, Gallatin Co. (Early Wisconsin); Henry Co. (Late Wisconsin). It is most abundant in the Peorian interval, common in early Wisconsin time, and rare in late Wisconsin. It is not abundant, apparently, in Yarmouth or Sangamon time.

This small Succinea has been identified as *grosvenori*, *avara*, and *vermeta*, and certain specimens resemble each of these species. In the paper in Journ. Geol., XXX, pp. 44–56, the writer referred the form to *vermeta* Say, a variety of *avara*. It is not this form, however, being smaller, with a rounder aperture and a relatively longer spire. It appears to be most nearly related to *grosvenori* Lea, the fossil resembling certain small or young specimens of that species. The aperture is, however, smaller, rounder and less elongated, and the shell is much narrower, besides being only about half the size of adult *grosvenori*. Comparisons have been made with specimens from Arizona and Colorado identified by Pilsbry. This same form was reported as *verrilli* Bland by early Iowan geologists and the shell, in many of its forms, does resemble Binney's figure of this species. True *grosvenori* is reported from the Iowa loess by Shimek, but none have been seen from Illinois. *Gelida* occurs in the Iowan loess and some of the Iowa records of *grosvenori* may have been based on this form.

Pomatiopsis scalaris nov. sp.

Shell elongated, turreted, scalariform; spire long, scalar; sutures deeply impressed; whorls about 8, very convex, the body whorl disproportionately larger than the preceding whorl; umbilicus round, wide, deep; aperture roundly oval, peristome thin, continuous, the inner lip forming a rounded, erect border near the umbilicus.

L. 7.8; D. 3.5; Ap. L. 2.1; D. 1.6 mm. Type.
L. 7.2; D. 3.5; Ap. L. 2.2; D. 1.8 mm. Paratype.
L. 7.1; D. 3.5; Ap. L. 2.1; D. 1.6 mm. Paratype.
L. 7.5; D. 3.4; Ap. L. 2.2 mm. Paratype.

Type locality: New Harmony, Posey Co., Indiana, in Peorian loess. Types: Mus. Nat. Hist. Univ. Ill., P2321; Acad-Nat. Sci. Phila., 142713.

Distribution: Clark Co., 3 miles southwest of Marshall, in loessal silt (Yarmouth); Posey Co., Ind., in loess (Peorian).

Remarks: This Pomatiopsis is very abundant in the loess of the Wabash River, particularly at New Harmony. It has previously been identified as *lapidaria* (Fuller and Clapp, Bull. Geol. Soc. Amer., XIV, p. 162, 1903; Daniels, Nautilus, XIX, p. 63, 1905), but differs markedly from that species, which is abundant in the recent fauna of Indiana and Illinois. The whorls are shorter and wider, more convex, the sutures more deeply impressed, there is one more whorl, the umbilicus is rounder, wider, and deeper, the aperture is rounder and the body whorl is larger than the preceding whorl. The differences are so marked that the form must be regarded as a distinct species, though it is probably ancestral to the living *lapidaria*. True *lapidaria* has been collected in the loess-like clay of late Wisconsin age in Stephenson Co., Ill., associated with *Helicodiscus parallelus* and *Galba obrussa*, the *lapidaria* being exactly like the form living today in Illinois. *P. scalaris* has not been seen in deposits later than Peorian.

A NEW SUBGENUS AND SPECIES OF BULINUS FROM JAPAN

BY WILLIAM J. CLENCH
Museum of Comparative Zoology

CULMENELLA, nov. subg.

BULINUS HIRASEI, nov. sp. Fig. 1.

Description: Shell sinistral, very small, thin, umbilicated, translucent. Color dull amber. Whorls convex, $2\frac{1}{2}$ to 3, rapidly increasing in size. Spire produced, nuclear whorl smooth. Aperture large, flaring, especially at the base, rounded-ovate. Columellar lip reflected, forming a small umbilical orifice. Palatal lip simple. Suture deeply impressed. Columella very narrow and thin, inclined towards the left and forming a more or less continuous line with the inner margin of the parietal wall. Sculpture composed of many spiral ridges, quite evenly spaced, with minute longitudinal striae between each ridge.

Holotype. Length 3.4; width 2; aperture length 2.4; aperture width 1.4 mm. Walker 38964 (1).

Paratype. Length 2.7; width 1.4; aperture length 1.9; aperture width 1 mm. Walker 38964 (2).

Paratype. Length 3.1; width 2; aperture length 2.2; aperture width 1.2. M. C. Z. 51424.

Type locality: Province of Kawachi, Japan, "very rare", Y. Hirase collector.

Remarks: This species of *Bulinus* is the first to be reported from Japan, thus extending the range of the genus quite well into the north, the nearest other locality being the Philippine Islands.

B. hirasei differs materially from all other species of the genus *Bulinus* with the exception of *Bulinus* (*Ameria*) *aliciae* Reeve,[1] described from Australia. It differs from this species in being very much smaller in size, having a *smooth* nuclear whorl and a bell-shaped or flaring aperture. The aperture of *B.*

[1] Reeve, L., Proc. Zool. Soc. London, 1862, p. 100, text figures.

aliciae does not flare except to a slight degree at the base and resembles in appearance the aperture of *Planorbis scalaris* (Jay).

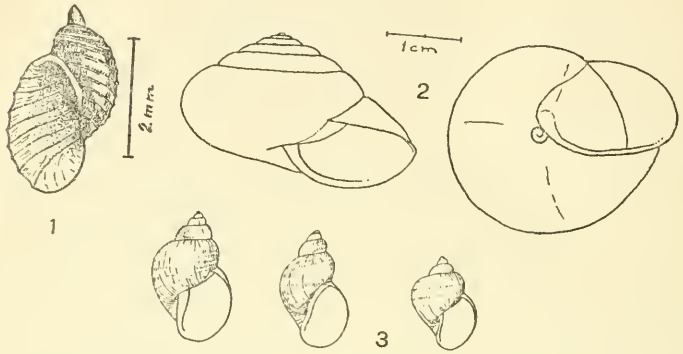

Fig. 1. *Bulinus hirasei* Clench. Fig. 2. *Monadenia fidelis celeuthia* Berry.
Fig. 3. *Lymnæa hedleyi* F. C. Baker.

At the suggestion of Dr. Bryant Walker, I take pleasure in naming this species after the late Y. Hirase, who has done so much to increase our knowledge of the Japanese fauna.

A NEW OREGONIAN SUBSPECIES OF MONADENIA FIDELIS

BY S. STILLMAN BERRY, REDLANDS, CALIFORNIA

Monadenia fidelis celeuthia new subspecies. Fig. 2.

Diagnosis: Shell of but moderate size and heaviness, conic, usually fairly well elevated; umbilicate, the umbilicus narrowly permeable to the apex, and having a diameter varying from $\frac{1}{9}$ to $\frac{1}{10}$ the maximum diameter of the shell.

Whorls usually about $6\frac{1}{2}$, the last with the superior portion descending rather abruptly in front. *Aperture* ovate, deflected from the vertical axis about 45–50°, the lower border scarcely flattened. Peristome but little everted or thickened above, but more so below and quite strongly reflected over the margin of the umbilicus, the edges converging and connected across the whorl by a thin whitish callus.

Sculpture of nepionic whorls badly eroded in all specimens seen, but evidently consisting of a very fine and close papillation minutely grilled out by very fine retractively slanting grooves, the descending ones being a trifle the more distinct. Lines of growth on succeeding whorls very strongly developed, wholly dominating the delicate system of grooved-out spiral sculpturing which covers the entire surface of the shell, and can readily be discerned by the naked eye, although a little less distinct below.

Color of base varying from chestnut to a dark liver brown, the spire variously toned on clouded sayal brown to snuff brown. Periphery conspicuously decorated with a sharp spiral band of bright seal brown about 2 mm. wide, set off both above and below by a similar or more often somewhat narrower band of warm buff or sayal brown, the upper of which may blend insensibly into the ground color of the spire or be set off by a narrower and relatively inconspicuous band of hazel. Some specimens, including the type, show two or three narrow hazel bands which continue nearly to the apex of the spire, while one specimen from Prospect has the lower buff band in its turn set off from the chestnut base by a narrow band of hazel.

Measurements:

	Max. Diam. mm.	Min. Diam. mm.	Alt.	Diam. Umbilicus mm.	No. of Whorls mm.
Type, from Trail	30.1	25.1	19.3	2.8	3½
Paratype	29.6	25.0	19.3	2.6	6⅓
Paratype	28.2	23.2	18.0	2.9	6
Paratype	27.8	23.7	18.8	2.3	6½
Paratype	27.2	22.5	17.3	2.4	6
Prospect	29.3	24.6	19.3	3.2	6¾
Prospect	27.7	23.3	19.7	2.7	6½

Type: Cat. 6205 Berry Collection. *Paratypes* in Cat. 6206 of same collection as well as Cat. 2237 in the collection of Mr. Allyn G. Smith.

Type locality: Trail, Rogue River Valley, Jackson County, Oregon; 6 specimens; Allyn G. Smith, 8: VIII: 1920.

Remarks: This very handsome small race of *fidelis* seems well set off from the typical form not only by its small size, thinner shell, and less conical spire, but by the prevalence of multiple banding. In general appearance it resembles some of the more southern members of the genus more than any other Oregon or Washington form I have seen. All the characters noted are very constant in the material in hand indicating that a well-marked race is represented. Two specimens taken farther up the valley at Prospect, Oregon, have, however, a notably wider umbilicus than those from Trail. Otherwise they are very similar. The banding details are unusually beautiful.

EXACT LOCALITIES OF CERTAIN CALIFORNIA LAND SNAILS

BY G. DALLAS HANNA

Through an oversight in the transmission of specimens which Dr. Pilsbry recently studied (Proc. Acad. Nat. Sci. Phila., Vol. 78, 1926, pp. 477–488) certain pertinent data as to localities were omitted. Owing to the tendency toward colonization among the California land snails, it is always desirable to record collecting stations as exactly as possible.

Helminthoglypta contracostae Pilsbry. One lot is given as from "Clear Lake, Lake Co., Calif." Plate 37, fig. 8, No. 22886, Calif. Acad. Sci.; this series is from a small wooded island very near the southern end of the lake, about one-fourth mile north of the outlet. Another lot, Plate 37, figs. 9–11, No. 22899 (C. A. S.) is from a knoll in the marshland just west of the outlet of the lake.

Helminthoglypta nickliniana anachoreta (W. G. Binney). The lot of shells from "Upper Lake, Lake County, Calif.", No. 22904 (C. A. S.) is from the rocky wooded land about four miles above the town of "Upper Lake," which is at the north end of Clear Lake; a large stream enters the lake from the north and a road follows the west side of this stream. The shells were collected along the west side of the road.

Monadenia mormonum hirsuta Pilsbry. The type lot of this subspecies (No. 21513 C. A. S.) collected by Dr. Emmet Rixford and me at Mountain Pass, Tuolumne County, Calif. This is a point where the road from Stockton to Sonora passes to the right of a large exposure of black basalt. The shells were found among the loose rocks at the base of this lava cliff.

The numbers cited by Dr. Pilsbry for the California Academy of Sciences material are the original lot numbers. All type material in this museum is segregated from collections so that the specimens he has figured will receive new numbers in the type series as follows:

Helminthoglypta contracostae Pilsbry. Plesiotypes, No. 2642–2645.

Helminthoglypta nickliniana anachoreta (W. G. Binney). Plesiotypes, Nos. 2636–2638.

Helminthoglypta arrosa mailliardi Pilsbry. Holotype, No. 2646; paratypes, Nos. 2647–2651.

Helminthoglypta tudiculata cyprcophila (Newcomb). Plesiotype, No. 2652.

Monadenia mormonum hirsuta Pilsbry. Holotype, No. 2639; paratypes, Nos. 2640, 2641.

NOMENCLATURE OF LEUCONIA, MELAMPUS AND TRUNCATELLA

BY H. A. PILSBRY

In the Proc. Malacological Society XVII, December, 1926, p. 74, Lieut.-Col. A. J. Peile called attention to the preoccupation of *Leuconia* Gray, 1840, by Grant for a sponge (1833), and he proposes to substitute LEUCOPEPLA, type *Voluta bidentata* Mont. He includes also in this genus *Leuconia occidentalis* Pfr., a species of Cuba, Florida, the Bahamas and Bermuda. This is a rather thinner species than *bidentata*, but with similar form and armature of the aperture. Under the microscope it shows spiral sculpture when unworn, such sculpture being lacking in *bidentata*. For this species there is a name *Microtralia* Dall,

proposed for *Tralia* (*Alexia?*) *minuscula* Dall (Proc. Davenport Acad. Nat. Sci, V, 1887, p. 69) = *Auricula?* (*Microtralia*) *minuscula* Dall (Bull. Mus. Comp. Zool. XXV, No. 9, 1884, p. 117). *T. minuscula* appears to be specifically identical with *Leuconia occidentalis* Pfr. (Mal. Bl. 1854, p. 155; Mon. Auric., p. 157), which we have from numerous places in Cuba and Florida.

There is a subgeneric name, *Palaeoleuca* Wenz, 1922, for the Paleocene species *Leuconia remiensis* Boissy.

If *Leuconia* has to be given up, probably the best course would be to recognize *Microtralia* (type *minuscula* = *occidentalis*) as a genus, with *Palaeoleuca* (type *remiensis*) and *Leucopepla* (type *bidentata*) as subgenera, if the latter is considered sufficiently different. *Leuconopsis* Hutton (type *L. obsoleta* Hutt.) is clearly a distinct genus.

Melampus bidentatus Say. In this connection it may be mentioned that Say's name for this common East Coast species is not preoccupied so far as I have been able to learn, and therefore need not be replaced by *M. corneus* or *M. lineatus* as many authors have done.

Acmea and Truncatella. It is to be regretted that Lieut.-Col. Peile in his list of Bermudan mollusks has used the name *Acmea* in place of *Truncatella*. I have pointed out in Nautilus, XL, p. 32, that such usage is inadmissible.

THREE NEW VARIETIES OF CYPRAEA

BY DR. PHIL. F. A. SCHILDER (BERLIN, GERMANY)

Cypraea neglecta, Sow., var. reductesignata, nov.

Shell very cylindrical, covered with pure white enamel through which the greyish-blue zones characteristic of the *C. hirundo* group can be seen; they appear bluish-purple, encircled with reddish-purple, and they are much reduced. There is only a narrow line surrounding the spire. A larger spot in the middle of the back, truncated towards the posterior, but sending out three triangular projections towards the anterior; and a

small triangular spot behind the anterior extremity; there are no brownish specks on the back nor square dark spots (usually to be found in *C. neglecta*) on the columellar side. Sides white with few minute chestnut specks which lie over the white callus; extremities with similar larger spots except posteriorly on the left side. Teeth thin and long, interstices very broad; the posterior columellar teeth cross the base about its middle; columellar teeth 13, on the outer lip 18. Length 16.25, breadth 8.75 mm.

One specimen: patria?

This striking variety is characterized by reduction of the bluish markings seen in *C. hirundo* L. and its allies, though in the same pattern; moreover it is suffused with white enamel.

CYPRAEA TURDUS, Lam. var. (subsp.?) DISTINGUENDA, nov.

Shell elongated pyriform, sides not thickened, extremities produced, the posterior one slightly curved up; aperture scarcely enlarged anteriorly, columellar teeth finer, closer and more numerous than in typical *C. turdus* Lam.

Red Sea: Abajil (1 specimen, Mus. Vienna, Austria); Ghuleifaka (1 specimen, Mus. Vienna, Austria); "Red Sea" (2 specimens, coll. mea).

This variety must not be confounded with var. *pyriformis* Sow. (1870, Thes. Conch., p. 37, fig. 284). *C. turdus* and both varieties can be distinguished as follows:

	turdus:	*pyriformis:*	*distinguenda:*
shape (dorsal view):	egg-shaped or shortened deltoidal, attenuated in the anterior half	almost rectangular, abruptly attenuated in the anterior fifth	elongated deltoidal, slowly attenuated in the anterior half
sides:	thickened	not thickened	not thickened
extremities:	blunt	blunt	pointed
posterior extremity:	not curved up, thickly melting into the back	not curved up, melting into the back	curved towards the back, peculiarly separable from it
aperture anteriorly:	less enlarged	much enlarged	almost not enlarged
outer lip in its anterior half:	rather bent outward	extremely bent outward	quite straight

outer lip posteriorly :	less prominent	less prominent	more prominent
inner lip posteriorly :	less attenuated	less attenuated	more attenuated
columellar teeth :	coarse, distant, 12–16 (see Hidalgo 1907)	coarse, distant	very fine, close and numerous (especially anteriorly), 17–21
interstice between the 1st and 2nd columellar tooth :	less large	large	very large

The distinctive characters between *turdus* and *distinguenda* are comparable to those between *C. tigris* Linn. and *C. vinosa* Gmel.; but *distinguenda* has the spire quite concealed. I have seen many hundred *turdus*, also intermediate specimens between *turdus* and *pyriformis* but no one between *turdus* and *distinguenda*.

All specimens of the new variety have the radial reddish-brown striae on the extremities more conspicuous than in *turdus* proper. There are two color varieties:

1. Back bluish-grey (Red Sea) or bluish-green (Ghuleifaka) with yellowish spots of rather equal size, sides white, suffused with rather pale rose color, with few pale orange spots shining through.

2. Back pale orange (Red Sea) or flesh color (Abajil), with many small spots and few larger ones, all only a little darker shadowed; sides much paler with dark reddish spots.

Cypraea gangranosa, Dill., var. amoena, nov.

Shell suffused with very brilliant white enamel through which the usual markings shine only in the middle of the back; the whitish spots are mostly ocellated, with pale greenish-blue points, the larger ones also surrounded with brownish rings, the interstices are pale greenish gray; dorsal line milky white, only on its deeply impressed transverse ends, dark reddish chestnut; sides, extremities and base unspotted, milky white.

One specimen: China Sea (coll. mea).

With regard to its size, shape and markings this shell recalls Sowerby's fig. 232 in Thes. Conch. (1870); but the white

enamel over the back is quite peculiar. Comparable to this, is the variety of *C. neglecta* Sow., described above. The extreme ends of the dorsal line are the only parts of the shell not white enameled and therefore vividly colored.

NOTES ON SOME SPECIES OF CYPRAEA

BY H. C. HIGGINS

We who would keep our shell collections as nearly up to date as possible, rewrite our labels as the rival systematists display their naming energy and question how much longer it will continue. Occasionally we change a label almost with a feeling of sadness as we relegate to the past some such familiar name as *Cypraea pantherina* Sol. and substitute for it *Cypraea vinosa* Gmel. It seems almost like parting with an old friend.

Attention was called to the need of change of name of another well-known shell, *Cypraea umbilicata* Sowb. in May, 1922, by J. H. Gatliff of Melbourne in a paper entitled "Additions to and Alterations in the Catalogue of Victorian Marine Mollusca" read before and published by the Royal Society of Victoria. The change has probably been made by few American collectors, perhaps from the fact that no American publication has made reference to the change, as far as I am aware. However, I am satisfied that Mr. Gatliff is right and that the change should be accepted. He calls attention that Mr. Iredale has proved that the name *C. umbilicata* is preoccupied by Dillwyn. He refers to an article by Iredale, Pro. Malacological Soc., London, Vol. 12, 1916, page 93, in which he says: "Dillwyn in his Index Hist. Conch. List, 1823, p. 32, gives a note identifying List. fig. 12, thus: 'This shell has been arranged as a variety of *Cypraea pyrum*, and as a separate species in Solander's MS. with the name *Cypraea umbilicata;* it has the teeth of a saffron color, and in *Cypraea pyrum* they are whitish.'" This quotation validates *Cypraea umbilicata* as of Dillwyn and invalidates *Cypraea umbilicata* of Sowerby, 1825.

As a new name had to be found for *C. umbilicata* Sowb. the

varietal name *alba* Cox., P. L. S., N. S. W., Vol. IV, 1879, was entitled to become the species name, and the name *C. hesitata* was substituted as a varietal name; hence the white shell formerly known as variety *alba* becomes the species, and the shell known as *C. umbilicata* becomes *C. alba* Cox variety *hesitata* Iredale.

I have in my collection two fine specimens of a Cypraea which is closely related to *C. alba hesitata* Iredale, but evidently a good species, *C. armeniaca* Verco. Sir Joseph Verco gave the history of this species which at first he thought might be a variety only, a shell with apricot coloration of *C. umbilicata* Sowb., but upon comparison with Tasmanian forms of that species he remarked: "Mine differ in shape, being more globular, higher and wider, not only relatively, but absolutely. No specimens were found that can be regarded as intergrading with *C. alba hesitata*, and the shell was raised to the rank of a species by Verco.

STREPTOSTYLA CHIRIQUIANA AND S. VIRIDULA

BY J. R. LE B. TOMLIN

STREPTOSTYLA CHIRIQUIANA Martens, Biol. Centr.-Am. Moll., p. 615, Jan., 1901.

Streptostylus flavescens da Costa, Pr. Malac. Soc. London, IX, p. 66, pl. vii, f. 1, Aug. 1st, 1900; not *flavescens* Sh. 1852.

Streptostylus pallidus da Costa, op. cit., p. 185, March 19, 1901, new name for *flavescens* da C.

In a recent paper[1] Dr. Pilsbry mentions that he has not seen this form and surmises that it may conceivably be identical with *viridula* Angas, which he figures on p. 96. The type specimen of *viridula* is very dead and mostly decorticated, measuring 16 mm. by 9½ mm. Pilsbry's fig. 22 C is taken from a much larger shell, but represents the species well. Our series in the Brit. Mus. contains another specimen which measures

[1] Proc. Ac. N. S. Philadelphia, lxxviii, p. 98, 1926.

16½ x 9; there is some variability in length of spire. The color at present is a dirty white with a slight tinge of yellowish, and has probably faded. *S. viridula* is a perfectly distinct species from *chiriquiana* and is distinguished by its dumpiness and greater breadth in proportion to length.

The color of *chiriquiana* is a curious light greenish waxy yellow; below the suture there is a striate zone, quite distinct if carefully examined but obscured by the thickness of the periostracum. The type measures exactly 22 x 11 mm. The British Museum has a set of four unnamed, marked "Chiriqui, 3–4000 feet", which seems to be a faded or more colorless form of *S. chiriquiana*.

I write this note on the type specimens at Pilsbry's request.

A NEW VARIETY OF AURIS AURISSCIURI (GUPPY)

BY GEO. H. CLAPP

AURIS AURISSCIURI LUTEA, n. var.

Differs from the typical form in the shell being pure white *without any trace of color markings* and, in fresh specimens, covered with a very thin, very pale yellow cuticle; columellar fold *white* or with a delicate tint of lilac; parietal callus *white;* microscopic granulation subobsolete and impressed spiral lines much more distinct than in the typical form.

Length 35.7, diam. 16.5 mm.; aperture, length 21 mm.

A very small specimen measures:

Length 30½, diam. 14½ mm.; aperture, length 18, width 10 mm.

Belmont, near Port-of-Spain, Trinidad.

Have seen five perfectly fresh and several dead specimens, which had lost the cuticle, so the variety appears to be well established.

A few eggs received from Belmont measure, approximately, 2 x 4 mm., and the young shells, just out of the eggs, have nearly 2 whorls.

Cotypes in my collection and Acad. Nat. Sci. Philadelphia (No. 89700).

In examining a large series of the typical form I find there is great variation in size and color, some being almost as light as var. *lutea* but always showing faint streaks of color, visible through the shell, and the columellar fold and parietal callus are brown.

The extremes in over 100 examined are as follows:

Largest: Length 42½, diam. 18½ mm.; aperture, length 24½, width 13 mm.

Smallest: Length 31, diam. 14 mm.; aperture, length 18½, width 9½ mm.

Slender: Length 38½, diam. 15½; aperture, length 20, width 12½ mm.

Globose: Length 36½, diam. 18½ mm.; aperture, length 22½, width 13 mm.

ANNIE E. LAW

Miss Law was born in Carlisle, England, and was the eldest of three children of John Law, Esq., who came with his family to Tennessee about the year 1850. They made their home in Maryville, Blount Co., Tenn. In the late '60s Miss Law became interested in shells and collected extensively in Tennessee and North Carolina, sending her material to Dr. James Lewis of Mohawk, N. Y. If his correspondence happens to be preserved it doubtless contains much of interest relating to Miss Law's activities at this time. Lewis published a catalogue of the Holston River shells she collected (Amer. Journ. Conch., VI, 1870), and two articles on her land shells. She discovered *Vitrinizonites latissimus* on Tusquita Bald Mountain, 6600 ft. (not Tennessee Bald, as Binney states); also *Helix chilhoweensis*, *H. lawi* (a very rare shell), *Zonites* [*Gastrodonta*] *acerra*, *Z. cerinoidea* var. *cuspidata*. Lea named *Unio lawi* in her honor, and W. G. Binney named *Zonites* (*Gastrodonta*) *lawi*. After Rugel she was thus one of the earliest explorers of this mountain

region, where she was followed by Mrs. George Andrews and finally by Ferriss and his friends.

After the death of her parents Miss Law went to California, spending four years in Hollister, San Benito Co. Returning east she spent a year with her friends in Tennessee, afterward living at Watsonville, Santa Cruz Co., California, where she died January 12, 1889. Besides her interest in mollusks, Miss Law was a musician of marked ability, and was known in the large circle of her friends for her talents as a poet and writer.

FOREIGN SHELLS IMPORTED INTO THE HAWAIIAN ISLANDS

BY D. THAANUM

The Hawaiian Islands have an equable climate warm enough for most tropical plants and animals to thrive, and not too warm for many of those of temperate climates. Adjusting themselves to the absence of winter, many species flourish astonishingly, and some become nuisances. Lying at the "crossroads of the Pacific," they are visited by vessels from all parts of the world, and as some of the early settlers, such as Hillebrand, were eager to introduce useful and ornamental plants, it is not surprising that foreign insects, snails and "weeds" were brought in. Among the land snails introduced by commerce and now established as residents may be mentioned *Opeas*, *Cecilioides*, *Amalia*, *Agriolimax*, *Philomycidae*, *Veronicella*, *Eulota* and *Viviparus*. It would be interesting to trace the dates when these genera appeared, if it could be done.

Of late years, every plant introduced into the Islands is carefully examined before leaving the wharf, and its insect and other inhabitants are picked off, as the damage already done by imported pests is enormous. A few years ago Mr. D. Thaanum sent the following list of shells brought in alive on imported plants and arrested by the Honolulu inspectors.

"From Java: *Subulina octona* (Brug.); *Opeas* sp.

From Manila: *Subulina octona* (Brug.); *Opeas javanicum* (Rve.); *Opeas* sp.; two minute species of '*Helix*,' and one which I take to be *Nesopupa*.

From Fiji Islands: *Subulina octona* (Brug.); *Opeas oparanum* (Pfr.); *Eulota similaris* (Fér.); *Veronicella* sp.

From Sydney: *Helix aspersa* L.; three immature shells.

From Singapore: A dark-colored form of *Nanina crossei* (Pfr.), adult; *Subulina octona;* two species of *Opeas.*

From Canton: *Succinea* sp.; *Acmella* near *A. scalaris* Hde., not quite mature.

From Japan: A species of *Succinea.*

Many of the *Subulina* and *Opeas* contained eggs."

NOTES AND NEWS

Note on the genera of Costa's Microdoride.— In 1861 O. G. Costa published a paper on minute invertebrates obtained chiefly from the Mediterranean coast of Africa. He proposed several new generic names, of which some were based on nepionic stages of larger animals. In order to clarify the synonymy, I propose to specify types for these genera. *Spirolidium* Costa, has eight years priority over *Parastrophia* De Folin, and is based on *S. mediterraneum* Costa. *Helicicella* Costa, according to Monterosato, is based on the young of *Danilia* and the type is *H. costellata* Costa. One of Costa's figures may represent a *Megalomphalus,* but this is quite distinct from *costellata.* For type of *Ammonocerina* Costa, I select *A. simplex* Costa, and for *Protomedea, P. elata* Costa. In this connection I may recall that Monterosato indicates that *Maravignia* Aradas, has priority over *Fossarus* Philippi, but I have not been able to verify the date of the paper of Aradas.—Wm. H. Dall.

The Relation of Organic Acids to the Presence of Shells and Opercula in Sediments.—Professor Kendall's brief discussion of opercula in the January number of The Nautilus, in which he attributes the occurrence of large numbers of horny opercula of fresh-water gastropods, in deposits that contain no shells, to the fact that acids have destroyed the shells but failed to destroy the opercula, is of particular interest to me, because

it fits into a theory that I recently set forth to account for the absence of calcareous fossils in formations that are important to the petroleum industry.[1] The Mowry formation, deposited in a sea of great extent, contains vast numbers of the scales of teleost fishes, which would not be easily affected by acids, but practically no bones, which would be destroyed by acids produced by vegetation. Though mollusks probably thrived in the sea, there is also an almost total absence of shells in the formation. Almost beyond doubt the shells, bones and teeth were destroyed by acids in the water at the time the sediments were being deposited, as natural casts would be found if the fossils were destroyed afterwards by acids in percolating water. The same explanation may apply to many other formations in which fossil shells should occur but from which they are absent.—JUNIUS HENDERSON, University of Colorado.

PERNA CALIFORNICA Conrad vs. P. HAWAIIENSIS Pease.—In the January number of THE NAUTILUS I mentioned the fact that Conrad's name is misleading because the shell occurs in the Hawaiian Islands instead of California. Attention should have been called to the attempt of Pease to rename the species *P. hawaiiensis* (Amer. Jour. Conch., VII, 25, 1871). He says: "The above species is confined in its distribution to the Hawaiian Islands. As doubts have arisen as to its identity for reason of its name, which is a misnomer, I have thought advisable to change it." Undoubtedly Pease's name would be a great improvement, but as Conrad's description and figure seem quite adequate and Pease does not add anything to the description, under the rules the change is unwarranted, and *hawaiiensis* is an exact synonym of *californicus*. —JUNIUS HENDERSON.

"NEWSPAPER SCIENCE" IN SCIENTIFIC MAGAZINES.—"Newspaper science" is not rigidly confined to newspapers. As an example of the ease with which it may creep into excellent

[1] Henderson, "Sources of material from which petroleum may have been derived." Proc. Calif. Acad. Sci., XV, 269–278, 1926.

scientific journals, the January number of the *Condor*, at page 75, mentions limpets as "crustaceans" and in the same paragraph also calls them "bivalves." Some of us, in our ignorance, have placed them in our collections with the univalve mollusks.—Junius Henderson.

The large scientific library of the late Dr. A. E. Ortmann is, we understand, to be sold by his widow (6310 Monitor St., Pittsburgh, Pa.). It will be of special value to a museum or university in which biological research is carried on.

North Carolina Land Shells.—The following species collected by Mr. S. C. Bishop of the N. Y. State Museum, Albany, have not often been collected, so that the localities are of interest:

Vitrinizonites latissimus (Lewis), Wayah, (Nantahala) Gap, at 4100 ft. Frying Pan Gap near Big Pigeon Mt.

Mesomphix subplanus (Binn), East fork Pigeon River near mouth of Hungry Creek.

Polygyra depilata Pils., along Mill Creek, Mt. Le Conte, 3000 ft. Frying Pan Gap near Big Pigeon Mt.—H. A. P.

Lymnæa (Bulimnæa) megasoma Say.—While at Cobalt, on September 24th of the present year, an hour or two of leisure was utilized to visit Sasaginaga Lake, northwest of the town, in the hope that it would afford specimens of this remarkable mollusc, which, twenty years ago, was common in Cobalt Lake itself, but, unfortunately, not collected in quantity before the waters became defiled.

My expectations were more than realized. Large shells were to be seen on dense beds of a small-leaved potamogeton in a sheltered bay, and several were easily secured. This, however, was but a prelude. In old prospect trenches, southeast of the lake, and parallel to the shore, the shell appeared in hundreds.

They were not as large as those in the lake, being apparently produced from eggs of the previous year, while the lake shells

found were three to four years old; but they were in most cases more than 30 mm. in length, and in perfect condition. Large suites were easily collected and are now available for distribution.

L. megasoma is unique in the lymnæan phylum. No pond snail found anywhere resembles it in shape or approaches it in lustre and richness of color. Its only rival in size and elegance of form is *L. stagnalis* as found in autumn in Brown's Inlet, Ottawa, and elsewhere in the Rideau Canal. The types of *megasoma* now in the museum of the Academy of Sciences, Philadelphia, were presented in 1823 by Dr. John J. Bigsby to Thomas Say, the naturalist attached to Long's Expedition. Say's description appears on page 11 of the appendix to Keating's *Narrative* and his figure on plate XV of the same work. The locality is stated to be "Bois Blanc Lake, N. W. T." This lake, as I am informed by Mr. Douglas, of the Geographic Board, is in the Rainy River District, and is now known as Basswood Lake. While *stagnalis* is found circum-boreally in Asia and Europe as well as in America, *megasoma* ranges only from Central Canada northerly and westerly as far as the Nelson and through the northern United States from Lake Champlain to Minnesota, with a few outliers southward in Ohio and Iowa. Near Ottawa it has been found sparingly in but two localities—in Meach Lake north of the Tilley Cottage, and in the McGoey pond, east of that lake. An immature shell from Meach Lake, which I presented to the U. S. National Museum at Washington, is remarkable for having a broad, spiral band on the body whorl. Whiteaves has recorded the species from a pond on Nuns' Island, Montreal, and there is an old record somewhere by Bell of its occurrence at Hawkesbury. I have found it in the Georgian Bay, in Lake Temagami, and elsewhere northward, but never until recently in quantity.

Its occurrence in waters so easily accessible as the Cobalt Sasaginaga Lake (there are many lakes so named in Canada), is of importance owing to the rarity and beauty of this unique species.—F. R. Latchford, *The Canadian Field Naturalist*, Nov. 1925.

The Effects of Changes in Nomenclature. A few days ago I was naming some shells for a friend. One of these happened to be a young *Busycon perversus*. My friend seemed surprised at the genus and said: "Is not that *Fulgur perversum*." I said that we used to call it *Fulgur*, but now we use the older name of *Busycon* Bolten. "That is too bad," he said, "*Fulgur canaliculatum* is the only shell my wife knows. Now that is changed, I think she will be discouraged."

There was a young lady in Lyme
Who knew all the shells at one time
But when they used Bolten
Her nerves were all broken
And now she is in a decline.—C. W. J.

Opeas pumilum (Pfr.) in the United States. Specimens of this tropical American species were found years ago (1907) in a greenhouse in Garfield Park, Chicago, by Mr. Jas. Zetek. Since then it was taken out of doors in a park in Savannah, Georgia, James B. Clark, 1923, and in Philadelphia (Nautilus, vol. 33, p. 31, 1919). Also on Dismal Key, Lee Co., Florida, Clarence B. Moore, 1920. An Indian species, *Opeas mauritianum* (Pfr.) was found in the palm house, Botanical Garden, Bronx Park, N. Y., in 1906, Frank C. Baker.—H. A. P.

Limax maximus var. krynickii in the Azores. Dr. Paul Bartsch sends me a couple of small slugs found on cabbage from Punta Delgada, Azores, by J. T. Rogers, Horticultural Inspector, at Charleston, S. C., Feb. 17, 1927. They are juvenile *L. maximus* var. *krynickii* Kal., with the markings on the mantle unusually heavy. The farm is known from Madeira, but Simroth reported only var. *concolor* Pini (as *cinereus-unicolor*) from the Azores.—T. D. A. Cockerell.

Patella stellæformis optima n. subsp. The shell is large, solid, ovate, depressed; sculpture of many low radial riblets about equal to their intervals, over a coarser sculpture of about

a dozen low, broad radial elevations. The depressed intervals between these elevations are mainly dull, deep maroon, and those between the riblets on the raised radii the same color diluted. Interior white, the central field clouded with cinnamon. Length 84, width 60, height 15 mm.

Yakushima, Osumi, Japan (Y. Hirase).

This may be a race of *P. stellæformis*, yet it differs conspicuously from all representatives of that species at hand.—H. A. Pilsbry.

We have to record, with sorrow, the death of William Healey Dall at Washington on March 27, at the age of 82.

PUBLICATIONS RECEIVED

Additional New Mollusks from Santa Elena Bay, Ecuador. By Paul Bartsch (Proc. U. S. Nat. Mus., Vol. 69, Art. 20, pp. 1–20, pls. 1–3, 1926). In this paper 12 new species of Pyramidellids and 2 new species of Melanellids are described and figured.—C. W. J.

The varieties of Planorbis campanulatus Say. By Mina L. Winslow (Occas. Papers Mus. Zool., Univ. Michigan, No. 180, pp. 1–9, pls. 1–2, Dec., 1926). Five varieties are recognized, two of which are described as new.—C. W. J.

A Revised Check List of Michigan Mollusca. By Mina L. Winslow (Occas. Papers Mus. Zool., Univ. Michigan, No. 181, 28 pages, Dec., 1926). The list of 1911 contained 398 species and varieties, the present list contains 428, with notes. —C. W. J.

Nomenclatoral Notes on American Fresh Water Mollusca. By Frank C. Baker (Trans. Wisconsin Acad. Sciences, Vol. 22, pp. 193–205, 1926). In the family Amnicolidae two

new genera *Hoyia* and *Birgella* and *Marstonia*, a new subgenus of Amnicola are proposed.—C. W. J.

Two New Helicoid Snails from the Mohave Desert. By S. S. Berry. Ann. Mag. N. H. (9), Vol. 18, pp. 490–493. *Helminthoglypta graniticola* and *H. mohaveana*. Related to the *H. traski* group.

Fossil Chitons from the Pleistocene of San Quintin Bay, L. C. By S. S. Berry. Amer. Journ. Science, Vol. 12, p. 455. Eight species, all still living, are mentioned.

A Note on the Occurrence and Habits of a Luminous Squid (*Abralia veranyi*) at Madeira. By S. S. Berry. Biol. Bull., Vol. 51, pp. 257–268. Comes into shallow water of Funchal Harbor at night during the summer months, supposedly for the purpose of mating, spawning, or both.—H. A. P.

The Radula of Proserpina. By H. Burrington Baker. Proc. A. N. S. Phila., 1926, pp. 449–451, fig. Dried examples of *P. depressa* from Cuba, collected by E. E. Hand supplied the radula, which "is remarkably close to that in *Calybium mouhoti* from Indo-China." "On the basis of the radula alone *Proserpina* could easily be included in the subfamily Vianinae of the Helicinidæ." The only previous information was from a figure by Gray, which Dr. Baker thinks was drawn from a *Helicina* radula, upside down.—H. A. P.

Diagnoses of undescribed new species of mollusks in the collection of the United States National Museum. By W. H. Dall. Proc. U. S. N. M., Vol. 70, pp. 1–11. 27 new species; among them the following from the United States: *Acmaea pulcherrima* (Guilding MS.), South Florida; *Liotia tortugana* Tortugas and near Miami; *L. huesonica*, off Key West; *Solariella periscopia*, Cape Lookout; *S. crossata*, off Fernandina, Fla.; *Calliostoma hendersoni*, Sambo Reefs, Fla.; *Emarginula phrixodes*, off Sambo Reef, Fla.; *Rimula aequisculpta*, off Ajax Reef, Fla.;

Diadora microsticta, S. Florida to Brazil; *Puncturella hendersoni*, off Sambo Reef, Fla.; *Scissurella proxima*, off S. Carolina; *Lepidopleurus carinatus*, Eastport, etc., Maine.

It has always been a mystery why so great an institution as the United States National Museum, which ought to set a high standard before other workers in descriptive zoology, is willing to issue unillustrated descriptions by the hundred. Everybody knows that only a small proportion of the species of shells are positively identifiable without figures. The effect of such publications, whether deliberately intended or not, is to discourage other investigators and drive them out of the field. However effective for a time, such a policy can hardly be advantageous to the Museum in the long run. This criticism is not aimed especially at the paper under consideration, as it applies to many others published in recent years.—H. A. P.

Genetic Experiments with Pond Snails Lymnaea and Physa. By E. D. Crabb. Amer. Naturalist LXI, 1927. Specimens having some peculiarity, such as a notched peristome or a prong tentacle, were bred with negative results; it was evident that the characters were not transmissible. The author concludes that "the ratios obtained by other investigators who have mated pond snails can be interpreted only in terms of matroclinous inheritance, or as being merely fortuitous." The new subspecies *Physa gyrina byersi* is proposed for the progeny of two individuals which laid loosely coiled egg masses instead of the usual reniform kind. *P. g. byersi* is not otherwise defined. The young did not lay coiled egg masses. Two cotypes have been deposited in A. N. S. Phila. museum, No. 142547.—H. A. P.

The Fauna of the Ripley Formation on Coon Creek, Tennessee. By Bruce Wade. U. S. Geol. Surv. Profess. Paper No. 137. The great variety of families and genera, the prevalence of large and beautiful species and their wonderful state of preservation, all make the Coon Creek one of the most interesting Cretaceous faunas in America. The great value of

the fauna to palaeontology is from the fact that owing to the perfect preservation, the true family and generic characters are apparent, while hitherto the same or related species have been incorrectly classified owing to their imperfection, as in the case of many New Jersey Cretaceous mollusks. The interesting introduction is followed by the descriptions of species, some 350 mollusks. Other classes of invertebrates are also included. We note that the name *Dentalium inornatum* (page 100) is already in use (see Man. Conch., XVIII, p. 231). This Coon Creek form may be called *Dentalium demersum*. *D. intercalatum* Wade (not Gould) may become *Dentalium wadei*. A species of *Scalpellum*, (*S. gabbi*) is described from a carina and an upper lateral plate (incorrectly called cardinal and scutal plates). It is very interesting for the modern type of carina (figured inverted). Whether it belongs to *Scalpellum* or to *Euscalpellum* is doubtful until other plates are found.—H. A. P.

Zur marinen Molluskenfauna Südkaliforniens. Von Dr. S. Jaeckel. Zoologischer Anzeiger Bd. 70, Heft 1–2, Feb., 1927, pp. 45–50. A list of 91 species from Santa Catalina Island and San Diego, collected in 1922 or 1923 by Herr Schröder. A supposed new species, *Pedipes biangulatus* is described from one specimen taken at Santa Catalina (p. 48, figs. 1, 2). It is yellowish-brown, with distinct spiral striæ on the first three whorls, disappearing on the last. The first whorls are weakly convex; the last whorl has two blunt angles [one at shoulder, the other between basal and peripheral segments] on the last part, towards the aperture. The teeth are shown as similar to those of *P. unisulcatus*. Length 8 mm., breadth 5 mm. I take this shell to be merely a very old and somewhat deformed *P. unisulcatus* Cooper.

Five other species are reported as new to California: *Scalaria diadema* Sow., *Mitra melaleuca* Quoy, *Cypraea annulus* L., *Rotella gigantea* Less. and *Olivella consobrina* Lischke. Although the author entertains the idea of possible introduction in ballast, he remarks that the extraordinarily genial climatic conditions of southern California allow the colonization of southern species to appear as not impossible. The allusion to climate will

naturally appeal strongly to Californian conchologists, but it remains to be seen whether even that compliment to the "sunkist" State will induce them to add these South Sea and Japanese species to the California list.—H. A. P.

The Mollusca Collected by the University of Michigan-Williamson Expedition in Venezuela, Part V (Occ. Papers, Mus. Zool. Univ. Mich. No. 182, 1927). By H. Burrington Baker. In the Achatinidæ the anatomy of species of *Subulina*, *Obeliscus*, *Opeas*, *Pseudopeas* and *Leptinaria* is discussed and figured. *Rectobelus* is a new section for *Obeliscus rectus* n. sp., a small, slender species. Dysopeas is a new section for *Pseudopeas translucidum* and other American species of *Pseudopeas*. The spiral striation of the protoconch extends upon the later whorls. A new arrangement of the subgenera of *Leptinaria* is given, based chiefly upon the dentition. In the Urocoptidæ, the anatomy of *Brachypodella leucopleura* and *Microceramus bonairensis arubanus* is described. It is a valuable paper for the anatomical information given on genera which have been unknown or very imperfectly known heretofore. In some cases, such as the transfer of *Opeas gracile* to subgenus *Synopeas*, it seems doubtful whether the characters of the teeth are more fundamental than those of the shell.—H. A. P.

Gabb's California fossil type Gastropods. Proc. Acad. Nat. Sci., Phila., 1926, pp. 287–447, pls. 20–32. By Ralph B. Stewart. The location of the types of Gabb's Palaeontology of California on the eastern side of the continent, the workers on Californian paleontology on the western, has resulted in various erroneous identifications and a good deal of uncertainty. Mr. Stewart, familiar with the West Coast collections through several years' study, seeks to clear up the situation so far as possible by figuring the types or lectotypes, revising their classification and nomenclature according to modern standards, indicating the type localities and horizons, and discussing their relationships with other species. The work covers Cretaceous and Tertiary forms. The term Paleocene is used for the Martinez horizon, which is contrasted with the Eocene proper or

Tejón group. The changes in current classification of Californian fossils are too numerous for enumeration here; those interested will consult the paper.[1] The discussions of the classification and nomenclature of naticid and strombid gastropods are particularly interesting. *Plejona* Bolten is shown to have *Voluta ebraea* as type; the fossil Plejonas (in Dall's sense) will be called *Volutospina* Newton. The following new genera are proposed.

Olequakia, type *Tritonium hornii* Gabb.

Whitneyella, type *Fasciolaria sinuata* Gabb.

Plectocion, type *Neptunea curvirostris* Gabb.

Nekewis, type *Fasciolaria io* Gabb.

Perissitys, type *Perissolax brevirostris* Gabb.

Cophocara, type *Cophocara stantoni* (n. n. for *Perissolax brevirostris* Gabb, in part).

Noetica, type *N. gabbi* (n. n. for *Cylindrites brevis* Gabb).

Lithophysema, type *Haminea grandis* Aldrich, Eocene of Louisiana.

The following are new specific names:

Amaurellina moragai.
Cypraea castacensis.
Ficopsis cooperiana.
Ranellina pilsbryi.
Brachysphingus gabbi.

While the work will be of special use to West Coast palaeontologists, it has also a wider interest on account of the incidental discussions mentioned.—H. A. P.

A Revised Check List of Michigan Mollusca. By Mina L. Winslow. Occas. Pap. Mus. Zool. Univ. Mich. No. 181. The place of description, type localities and location of type specimens are given for all forms described originally from Michigan. Various species erroneously attributed to the State in former publications are discussed. 49 species and subspecies here appear on the Michigan list for the first time. No less than 87 species of *Pisidium* are enumerated, and 8 of the total of 428 are foreign species. It is an interesting and valuable list.—H. A. P.

[1] Separate copies are obtainable from the Academy.

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